

# SEQUENCE LISTING

<110> Carozzi, Nadine  
Hargiss, Tracy  
Kozziel, Michael G.  
Duck, Nicholas B.  
Carr, Brian

<120> AXMI-008, A Delta-Endotoxin Gene and  
Methods for Its Use

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Val	Ser	Lys	Ala	Asp	Phe	Arg	Arg	Val	Gly	Gly	Pro	Asp	Leu	Asn	Tyr	
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Asp	Ala	Gly	Asn	Asn	Gly	Leu	Ser	Arg	Met	Thr	Ile	Glu	Ser	Thr	Phe	
	450					455				460						
Pro	Leu	Val	Leu	His	Ser	Asn	Gly	Val	Arg	Gly	Pro	Ser	His	Arg	Leu	
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Ser	Asn	Ala	Ala	Cys	Val	Val	Tyr	Gly	Asn	Ser	Arg	Val	Asn	Val	Tyr	
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Gly	Trp	Thr	His	Thr	Ser	Leu	Lys	Arg	Glu	Asn	Ile	Ile	Glu	Ala	Asn	
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Gln	Ile	Thr	Gln	Ile	Pro	Ala	Val	Lys	Ser	Tyr	Tyr	Leu	Gln	Asn	Tyr	
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Ala	Gly	Gly	Gly	Ile	Arg	Leu	Ile	Ile	Asn	Asn	Lys	Thr	Ala	Gly	Gln	
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Ser	Tyr	Arg	Ile	Arg	Phe	Arg	Tyr	Ala	Ala	Asp	Lys	Ala	Ala	Phe	Phe	





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tat ttt aaa ctt tca gaa aga gat ttc aat gaa att cta gga ggg tca Tyr Phe Lys Leu Ser Glu Arg Asp Phe Asn Glu Ile Leu Gly Gly Ser 165 170 175			528
ttg tca aga aac aat gct caa gta ttg tta tta cct act ttt gca caa Leu Ser Arg Asn Asn Ala Gln Val Leu Leu Leu Pro Thr Phe Ala Gln 180 185 190			576
gct gca aat gtg cag tta tta cta tta agg gat gca gtt caa tat aaa Ala Ala Asn Val Gln Leu Leu Leu Leu Arg Asp Ala Val Gln Tyr Lys 195 200 205			624
gca caa tgg ttc cca ttt ttg agt gca gag aat gta aga tcg gaa tta Ala Gln Trp Phe Pro Phe Leu Ser Ala Glu Asn Val Arg Ser Glu Leu 210 215 220			672
ata tca cct aac agt ggt tgt gat ttt acc ggt gat tac tat gag cga Ile Ser Pro Asn Ser Gly Cys Asp Phe Thr Gly Asp Tyr Tyr Glu Arg 225 230 235 240			720
tta aaa tgc aaa acg gca gag tat acc aat tat tgt tta tat tgg tat Leu Lys Cys Lys Thr Ala Glu Tyr Thr Asn Tyr Cys Leu Tyr Trp Tyr 245 250 255			768
cag gta ggt tta aat cag ata aaa cag ggg ggg aca ggt gct gac act Gln Val Gly Leu Asn Gln Ile Lys Gln Gly Gly Thr Gly Ala Asp Thr 260 265 270			816
tgg tcg aaa ttt aat aaa ttt cgt aga gaa atg acg ttg gcg gta ttg Trp Ser Lys Phe Asn Lys Phe Arg Arg Glu Met Thr Leu Ala Val Leu 275 280 285			864
gat att atc gct ata ttt cca act tat gat ttt gag aaa tat cca ttg Asp Ile Ile Ala Ile Phe Pro Thr Tyr Asp Phe Glu Lys Tyr Pro Leu 290 295 300			912
cca aca cat gta gag ttg act agg gaa att tat aca gat gca gtg gga Pro Thr His Val Glu Leu Thr Arg Glu Ile Tyr Thr Asp Ala Val Gly 305 310 315 320			960
tat tca tcg gga act tat agt tgg tta cgg aat tgg cct aat act ttt Tyr Ser Ser Gly Thr Tyr Ser Trp Leu Arg Asn Trp Pro Asn Thr Phe 325 330 335			1008
aat ggg tta gag gct aat gga aca cgg gga cct ggt tta gtt act tgg Asn Gly Leu Glu Ala Asn Gly Thr Arg Gly Pro Gly Leu Val Thr Trp 340 345 350			1056

ctt agc aaa ata ggt ata tat aat gag tat gtt tcg aga tat ttt gcc	1104
Leu Ser Lys Ile Gly Ile Tyr Asn Glu Tyr Val Ser Arg Tyr Phe Ala	
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ggc tgg gta gga act cgt cat tat gaa gac tac aca aag ggt aac ggt	1152
Gly Trp Val Gly Thr Arg His Tyr Glu Asp Tyr Thr Lys Gly Asn Gly	
370 375 380	
att ttt caa cgt atg tct gga act acg agt aat gat cta cgt aat att	1200
Ile Phe Gln Arg Met Ser Gly Thr Thr Ser Asn Asp Leu Arg Asn Ile	
385 390 395 400	
gat ttt cag aat gcc gat gta tat aaa att act tca tta gct atc atg	1248
Asp Phe Gln Asn Ala Asp Val Tyr Lys Ile Thr Ser Leu Ala Ile Met	
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aac cta gta gga gag act acc gct aga cca gag tat cgt gtt tca aag	1296
Asn Leu Val Gly Glu Thr Thr Ala Arg Pro Glu Tyr Arg Val Ser Lys	
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gca gat ttt cgt agg gta ggg gga cct gat tta aat tat gat gca ggt	1344
Ala Asp Phe Arg Arg Val Gly Gly Pro Asp Leu Asn Tyr Asp Ala Gly	
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aat aat ggg cta agc agg atg aca att gaa tct acg ttc cca ctt gta	1392
Asn Asn Gly Leu Ser Arg Met Thr Ile Glu Ser Thr Phe Pro Leu Val	
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ttg cac tct aat ggt gtt aga gga ccc tct cat aga tta tca aat gcg	1440
Leu His Ser Asn Gly Val Arg Gly Pro Ser His Arg Leu Ser Asn Ala	
465 470 475 480	
gca tgt gtt gta tat gga aac tcc aga gtt aac gta tat ggt tgg aca	1488
Ala Cys Val Val Tyr Gly Asn Ser Arg Val Asn Val Tyr Gly Trp Thr	
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cat aca agt tta aaa cgt gaa aat ata att gaa gcc aat caa att aca	1536
His Thr Ser Leu Lys Arg Glu Asn Ile Ile Glu Ala Asn Gln Ile Thr	
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caa ata ccg gcg gtg aag agt tat tac ctt caa aat tat ctt gct aat	1584
Gln Ile Pro Ala Val Lys Ser Tyr Tyr Leu Gln Asn Tyr Leu Ala Asn	
515 520 525	
gcc tat acc tat gta ata aaa ggc act cat aca ggt ggg gat tta atc	1632
Ala Tyr Thr Tyr Val Ile Lys Gly Thr His Thr Gly Gly Asp Leu Ile	
530 535 540	
cgt ttt tta aga aca aaa tca gag tat aac gca gtt tat gca ggt ggc	1680
Arg Phe Leu Arg Thr Lys Ser Glu Tyr Asn Ala Val Tyr Ala Gly Gly	
545 550 555 560	
gga att aga ttg att att aat aac aaa act gca gga caa agt tac cgt	1728
Gly Ile Arg Leu Ile Ile Asn Asn Lys Thr Ala Gly Gln Ser Tyr Arg	
565 570 575	

att cgt ttt cgt tat gct gca gat aaa gct gct ttc ttt agt gta tat	1776
Ile Arg Phe Arg Tyr Ala Ala Asp Lys Ala Ala Phe Phe Ser Val Tyr	
580 585 590	
ctt tat cca gga ggt tgg ggt tca aat cgt ttt gta tcg ctt gaa aaa	1824
Leu Tyr Pro Gly Gly Trp Gly Ser Asn Arg Phe Val Ser Leu Glu Lys	
595 600 605	
tct tac tct gga aat tat gac gat tta aaa tat agt gat ttt aaa ttc	1872
Ser Tyr Ser Ser Gly Asn Tyr Asp Asp Leu Lys Tyr Ser Asp Phe Lys Phe	
610 615 620	
gct gaa att atc aca cct cca tta cct agt tca aac att cag atg gat	1920
Ala Glu Ile Ile Thr Pro Pro Leu Pro Ser Ser Asn Ile Gln Met Asp	
625 630 635 640	
gtg gag atg caa gcg aat agt ttt caa tca gat gta aac gtg gtt ctc	1968
Val Glu Met Gln Ala Asn Ser Phe Gln Ser Asp Val Asn Val Val Leu	
645 650 655	
gac aaa att gaa ttc ctc cca agt aat aca aca act tta gaa tat gag	2016
Asp Lys Ile Glu Phe Leu Pro Ser Asn Thr Thr Thr Leu Glu Tyr Glu	
660 665 670	
gga gaa cgg gac cta gaa aaa aca aag aac gcg gtg aac gat ctg ttt	2064
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acc aat taa	2073
Thr Asn *	
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<400> 5

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Asp Met Ser Thr Met Ser Trp Asn Asp Cys Gln Gly Ile Ser Trp Asp	
35 40 45	
Glu Ile Trp Glu Ser Val Glu Thr Ile Thr Ser Ile Gly Ile Asn Leu	
50 55 60	
Ile Glu Phe Val Ile Glu Pro Ser Leu Gly Gly Ile Asn Thr Leu Leu	
65 70 75 80	
Ser Ile Ile Gly Lys Leu Ile Pro Thr Asn Arg Gln Thr Val Ser Ala	
85 90 95	
Leu Ser Ile Cys Asp Leu Leu Ser Ile Ile Arg Lys Glu Val Ala Asp	
100 105 110	
Ser Val Leu Ser Asp Ala Ile Ala Asp Phe Asp Gly Lys Leu Lys Asn	
115 120 125	
Tyr Arg Glu Tyr Tyr Leu Ser Tyr Leu Gly Ala Trp Leu Lys Asp Gly	
130 135 140	

Lys	Pro	Leu	Gln	Lys	Thr	Asn	Asn	Ser	Asp	Ile	Gly	Gln	Leu	Val	Tyr
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Tyr	Phe	Lys	Leu	Ser	Glu	Arg	Asp	Phe	Asn	Glu	Ile	Leu	Gly	Gly	Ser
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Leu	Ser	Arg	Asn	Asn	Ala	Gln	Val	Leu	Leu	Leu	Pro	Thr	Phe	Ala	Gln
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Ala	Ala	Asn	Val	Gln	Leu	Leu	Leu	Leu	Arg	Asp	Ala	Val	Gln	Tyr	Lys
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Ala	Gln	Trp	Phe	Pro	Phe	Leu	Ser	Ala	Glu	Asn	Val	Arg	Ser	Glu	Leu
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Ile	Ser	Pro	Asn	Ser	Gly	Cys	Asp	Phe	Thr	Gly	Asp	Tyr	Tyr	Glu	Arg
225					230					235					240
Leu	Lys	Cys	Lys	Thr	Ala	Glu	Tyr	Thr	Asn	Tyr	Cys	Leu	Tyr	Trp	Tyr
			245						250						255
Gln	Val	Gly	Leu	Asn	Gln	Ile	Lys	Gln	Gly	Gly	Thr	Gly	Ala	Asp	Thr
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Trp	Ser	Lys	Phe	Asn	Lys	Phe	Arg	Arg	Glu	Met	Thr	Leu	Ala	Val	Leu
		275					280						285		
Asp	Ile	Ile	Ala	Ile	Phe	Pro	Thr	Tyr	Asp	Phe	Glu	Lys	Tyr	Pro	Leu
	290					295					300				
Pro	Thr	His	Val	Glu	Leu	Thr	Arg	Glu	Ile	Tyr	Thr	Asp	Ala	Val	Gly
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Tyr	Ser	Ser	Gly	Thr	Tyr	Ser	Trp	Leu	Arg	Asn	Trp	Pro	Asn	Thr	Phe
			325						330						335
Asn	Gly	Leu	Glu	Ala	Asn	Gly	Thr	Arg	Gly	Pro	Gly	Leu	Val	Thr	Trp
		340						345					350		
Leu	Ser	Lys	Ile	Gly	Ile	Tyr	Asn	Glu	Tyr	Val	Ser	Arg	Tyr	Phe	Ala
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Gly	Trp	Val	Gly	Thr	Arg	His	Tyr	Glu	Asp	Tyr	Thr	Lys	Gly	Asn	Gly
	370					375					380				
Ile	Phe	Gln	Arg	Met	Ser	Gly	Thr	Thr	Ser	Asn	Asp	Leu	Arg	Asn	Ile
385					390					395					400
Asp	Phe	Gln	Asn	Ala	Asp	Val	Tyr	Lys	Ile	Thr	Ser	Leu	Ala	Ile	Met
			405						410						415
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		420						425					430		
Ala	Asp	Phe	Arg	Arg	Val	Gly	Gly	Pro	Asp	Leu	Asn	Tyr	Asp	Ala	Gly
		435					440					445			
Asn	Asn	Gly	Leu	Ser	Arg	Met	Thr	Ile	Glu	Ser	Thr	Phe	Pro	Leu	Val
	450					455					460				
Leu	His	Ser	Asn	Gly	Val	Arg	Gly	Pro	Ser	His	Arg	Leu	Ser	Asn	Ala
465					470					475					480
Ala	Cys	Val	Val	Tyr	Gly	Asn	Ser	Arg	Val	Asn	Val	Tyr	Gly	Trp	Thr
			485						490						495
His	Thr	Ser	Leu	Lys	Arg	Glu	Asn	Ile	Ile	Glu	Ala	Asn	Gln	Ile	Thr
		500						505					510		
Gln	Ile	Pro	Ala	Val	Lys	Ser	Tyr	Tyr	Leu	Gln	Asn	Tyr	Leu	Ala	Asn
		515					520					525			
Ala	Tyr	Thr	Tyr	Val	Ile	Lys	Gly	Thr	His	Thr	Gly	Gly	Asp	Leu	Ile
	530					535					540				
Arg	Phe	Leu	Arg	Thr	Lys	Ser	Glu	Tyr	Asn	Ala	Val	Tyr	Ala	Gly	Gly
545					550					555					560
Gly	Ile	Arg	Leu	Ile	Ile	Asn	Asn	Lys	Thr	Ala	Gly	Gln	Ser	Tyr	Arg
			565						570						575
Ile	Arg	Phe	Arg	Tyr	Ala	Ala	Asp	Lys	Ala	Ala	Phe	Phe	Ser	Val	Tyr
		580						585					590		
Leu	Tyr	Pro	Gly	Gly	Trp	Gly	Ser	Asn	Arg	Phe	Val	Ser	Leu	Glu	Lys



gtg gga agt agt aaa gat ttg aaa tta atg gta aca cgt tac ggg aaa	432
Val Gly Ser Ser Lys Asp Leu Lys Leu Met Val Thr Arg Tyr Gly Lys	
130 135 140	
gaa att gat gct atc atg aat gtt cca aat gat ttg gcc tat atg cag	480
Glu Ile Asp Ala Ile Met Asn Val Pro Asn Asp Leu Ala Tyr Met Gln	
145 150 155 160	
cct aat cct tca tgt gga gat tat cgc tgt gaa tca tcg tct cag tat	528
Pro Asn Pro Ser Cys Gly Asp Tyr Arg Cys Glu Ser Ser Ser Gln Tyr	
165 170 175	
gtg agc caa ggg tat cct aca cca aca gat gga tat gct ccc gat atg	576
Val Ser Gln Gly Tyr Pro Thr Pro Thr Asp Gly Tyr Ala Pro Asp Met	
180 185 190	
tat gca tgc ccg caa aat ata gat aga aag cat gtg aag tgt cac gat	624
Tyr Ala Cys Pro Gln Asn Ile Asp Arg Lys His Val Lys Cys His Asp	
195 200 205	
cgt cat cca ttt gat ttt cat att gac acc gga gaa gta gat aca aat	672
Arg His Pro Phe Asp Phe His Ile Asp Thr Gly Glu Val Asp Thr Asn	
210 215 220	
aca aat gta ggt att gat gtc tta tta aaa att tct aat cca gat gga	720
Thr Asn Val Gly Ile Asp Val Leu Leu Lys Ile Ser Asn Pro Asp Gly	
225 230 235 240	
tac gct aca gta ggg aat cta gaa gtc att gaa gaa gga cca cta aca	768
Tyr Ala Thr Val Gly Asn Leu Glu Val Ile Glu Glu Gly Pro Leu Thr	
245 250 255	
ggg gaa gca ttg gca cat gtg aaa caa aag gaa aag aaa tgg aaa caa	816
Gly Glu Ala Leu Ala His Val Lys Gln Lys Glu Lys Lys Trp Lys Gln	
260 265 270	
cac atg gag aaa aaa cgt tgg gaa aca caa caa gcc tat gat cca gca	864
His Met Glu Lys Lys Arg Trp Glu Thr Gln Gln Ala Tyr Asp Pro Ala	
275 280 285	
aaa cag gct gta gat gca tta ttt aca aat gaa caa gag tta cac tat	912
Lys Gln Ala Val Asp Ala Leu Phe Thr Asn Glu Gln Glu Leu His Tyr	
290 295 300	
cat att act tta gat cat att caa aac gct gat cga ctg gta cag tcg	960
His Ile Thr Leu Asp His Ile Gln Asn Ala Asp Arg Leu Val Gln Ser	
305 310 315 320	
att ccc tat gta tac cat aat tgg tta ccg aat gct cca ggt atg aac	1008
Ile Pro Tyr Val Tyr His Asn Trp Leu Pro Asn Ala Pro Gly Met Asn	
325 330 335	
tat gat gta tat caa gag tta aac gca cgt atc atg caa ggt tat aat	1056
Tyr Asp Val Tyr Gln Glu Leu Asn Ala Arg Ile Met Gln Gly Tyr Asn	
340 345 350	
tta tat gat gca cga aat gtc ata aca aat ggt gac ttt aca caa gga	1104

Leu Tyr Asp Ala Arg Asn Val Ile Thr Asn Gly Asp Phe Thr Gln Gly	
355 360 365	
tta cag gga tgg cac gca aca gga aat gcc gcg gta caa caa atg gat	1152
Leu Gln Gly Trp His Ala Thr Gly Asn Ala Ala Val Gln Gln Met Asp	
370 375 380	
gga gct tca gta tta gtt cta tca aat tgg agc gcg ggg gta tct caa	1200
Gly Ala Ser Val Leu Val Leu Ser Asn Trp Ser Ala Gly Val Ser Gln	
385 390 395 400	
aac ttg cat gct caa gat cat cat gga tat gtg tta cgt gtg att gcc	1248
Asn Leu His Ala Gln Asp His His Gly Tyr Val Leu Arg Val Ile Ala	
405 410 415	
aaa aaa gaa gga cct gga aaa ggg tat gta acg atg atg gat tgt aat	1296
Lys Lys Glu Gly Pro Gly Lys Gly Tyr Val Thr Met Met Asp Cys Asn	
420 425 430	
gga aag cag gaa aca ctt aag ttc act tct tgc gaa gaa gga tat atg	1344
Gly Lys Gln Glu Thr Leu Lys Phe Thr Ser Cys Glu Glu Gly Tyr Met	
435 440 445	
aca aaa aca gta gag gta ttc cca gaa agt gat cgt gta cgg att gaa	1392
Thr Lys Thr Val Glu Val Phe Pro Glu Ser Asp Arg Val Arg Ile Glu	
450 455 460	
ata gga gaa acc gaa ggt aca ttt tat ata gat agc atc gag ttg ctt	1440
Ile Gly Glu Thr Glu Gly Thr Phe Tyr Ile Asp Ser Ile Glu Leu Leu	
465 470 475 480	
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Cys Met Gln Gly Tyr Asp Asn Asn Asn Asn Leu His Thr Gly Asn Met	
485 490 495	
tat gag caa agt tat aat gga aat tat aat caa aat act agc gat gtg	1536
Tyr Glu Gln Ser Tyr Asn Gly Asn Tyr Asn Gln Asn Thr Ser Asp Val	
500 505 510	
tat tac caa ggg tat aca aac aac tat aac caa gac tct agt aat atg	1584
Tyr Tyr Gln Gly Tyr Thr Asn Asn Tyr Asn Gln Asp Ser Ser Asn Met	
515 520 525	
tat aat caa aat tat act aac aat gat gac ctg cat tcc ggt tgc aca	1632
Tyr Asn Gln Asn Tyr Thr Asn Asn Asp Asp Leu His Ser Gly Cys Thr	
530 535 540	
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Arg *	

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 <212> PRT  
 <213> Bacillus thuringiensis

<400> 7

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Ser	Asp	Glu	Gln	Asn	Pro	Gln	Glu	Lys	Ile	Met	Leu	Trp	Asp	Glu	Ile
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Lys	Leu	Ala	Lys	Gln	Leu	Ser	Gln	Ser	Arg	Asn	Leu	Leu	Gln	Asn	Gly
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Ser	Asn	Asn	Pro	Ile	Phe	Lys	Gly	Lys	Phe	Leu	Gln	Met	Arg	Gly	Ala
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Arg	Asp	Ile	Tyr	Gly	Thr	Leu	Phe	Pro	Thr	Tyr	Ile	Cys	Gln	Lys	Ile
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Asp	Glu	Ser	Lys	Leu	Lys	Pro	Tyr	Thr	Arg	Tyr	Arg	Val	Arg	Gly	Phe
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Val	Gly	Ser	Ser	Lys	Asp	Leu	Lys	Leu	Met	Val	Thr	Arg	Tyr	Gly	Lys
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Glu	Ile	Asp	Ala	Ile	Met	Asn	Val	Pro	Asn	Asp	Leu	Ala	Tyr	Met	Gln
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Pro	Asn	Pro	Ser	Cys	Gly	Asp	Tyr	Arg	Cys	Glu	Ser	Ser	Ser	Gln	Tyr
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Val	Ser	Gln	Gly	Tyr	Pro	Thr	Pro	Thr	Asp	Gly	Tyr	Ala	Pro	Asp	Met
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Tyr	Ala	Cys	Pro	Gln	Asn	Ile	Asp	Arg	Lys	His	Val	Lys	Cys	His	Asp
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Thr	Asn	Val	Gly	Ile	Asp	Val	Leu	Leu	Lys	Ile	Ser	Asn	Pro	Asp	Gly
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Tyr	Ala	Thr	Val	Gly	Asn	Leu	Glu	Val	Ile	Glu	Glu	Gly	Pro	Leu	Thr
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Ile	Pro	Tyr	Val	Tyr	His	Asn	Trp	Leu	Pro	Asn	Ala	Pro	Gly	Met	Asn
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Leu	Tyr	Asp	Ala	Arg	Asn	Val	Ile	Thr	Asn	Gly	Asp	Phe	Thr	Gln	Gly
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Leu	Gln	Gly	Trp	His	Ala	Thr	Gly	Asn	Ala	Ala	Val	Gln	Gln	Met	Asp
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Asn	Leu	His	Ala	Gln	Asp	His	His	Gly	Tyr	Val	Leu	Arg	Val	Ile	Ala
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Lys Lys Glu Gly Pro Gly Lys Gly Tyr Val Thr Met Met Asp Cys Asn  
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 Gly Lys Gln Glu Thr Leu Lys Phe Thr Ser Cys Glu Glu Gly Tyr Met  
                   435                  440                  445  
 Thr Lys Thr Val Glu Val Phe Pro Glu Ser Asp Arg Val Arg Ile Glu  
                   450                  455                  460  
 Ile Gly Glu Thr Glu Gly Thr Phe Tyr Ile Asp Ser Ile Glu Leu Leu  
 465                  470                  475                  480  
 Cys Met Gln Gly Tyr Asp Asn Asn Asn Asn Leu His Thr Gly Asn Met  
                   485                  490                  495  
 Tyr Glu Gln Ser Tyr Asn Gly Asn Tyr Asn Gln Asn Thr Ser Asp Val  
                   500                  505                  510  
 Tyr Tyr Gln Gly Tyr Thr Asn Asn Tyr Asn Gln Asp Ser Ser Asn Met  
                   515                  520                  525  
 Tyr Asn Gln Asn Tyr Thr Asn Asn Asp Asp Leu His Ser Gly Cys Thr  
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 Arg

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 <213> Bacillus thuringiensis

<400> 8  
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                   20                  25                  30  
 Tyr Thr Pro Ile Asp Ile Ser Leu Thr Gln Phe Leu Leu Ser  
                   35                  40                  45  
 Glu Phe Val Pro Gly Ala Gly Phe Val Leu Gly Leu Val Asp Ile Ile  
                   50                  55                  60  
 Trp Gly Ile Phe Gly Pro Ser Gln Trp Asp Ala Phe Pro Val Gln Ile  
 65                  70                  75                  80  
 Glu Gln Leu Ile Asn Gln Arg Ile Glu Glu Phe Ala Arg Asn Gln Ala  
                   85                  90                  95  
 Ile Ser Arg Leu Glu Gly Leu Ser Asn Leu Tyr Gln Ile Tyr Ala Glu  
                   100                  105                  110  
 Ser Phe Arg Glu Trp Glu Ala Asp Pro Thr Asn Pro Ala Leu Arg Glu  
                   115                  120                  125  
 Glu Met Arg Ile Gln Phe Asn Asp Met Asn Ser Ala Leu Thr Thr Ala  
                   130                  135                  140  
 Ile Pro Leu Leu Ala Val Gln Asn Tyr Gln Val Pro Leu Leu Ser Val  
 145                  150                  155                  160  
 Tyr Val Gln Ala Ala Asn Leu His Leu Ser Val Leu Arg Asp Val Ser  
                   165                  170                  175  
 Val Phe Gly Gln Arg Trp Gly Phe Asp Ala Ala Thr Ile Asn Ser Arg  
                   180                  185                  190  
 Tyr Asn Asp Leu Thr Arg Leu Ile Gly Asn Tyr Thr Asp Tyr Ala Val  
                   195                  200                  205  
 Arg Trp Tyr Asn Thr Gly Leu Glu Arg Val Trp Gly Pro Asp Ser Arg  
                   210                  215                  220  
 Asp Trp Val Arg Tyr Asn Gln Phe Arg Arg Glu Leu Thr Leu Thr Val

225					230					235					240
Leu	Asp	Ile	Val	Ala	Leu	Phe	Ser	Asn	Tyr	Asp	Ser	Arg	Arg	Tyr	Pro
				245					250					255	
Ile	Arg	Thr	Val	Ser	Gln	Leu	Thr	Arg	Glu	Ile	Tyr	Thr	Asn	Pro	Val
			260					265					270		
Leu	Glu	Asn	Phe	Asp	Gly	Ser	Phe	Arg	Gly	Met	Ala	Gln	Arg	Ile	Glu
		275					280					285			
Gln	Asn	Ile	Arg	Gln	Pro	His	Leu	Met	Asp	Ile	Leu	Asn	Ser	Ile	Thr
	290					295				300					
Ile	Tyr	Thr	Asp	Val	His	Arg	Gly	Phe	Asn	Tyr	Trp	Ser	Gly	His	Gln
305					310					315				320	
Ile	Thr	Ala	Ser	Pro	Val	Gly	Phe	Ser	Gly	Pro	Glu	Phe	Ala	Phe	Pro
				325					330					335	
Leu	Phe	Gly	Asn	Ala	Gly	Asn	Ala	Ala	Pro	Pro	Val	Leu	Val	Ser	Leu
		340					345						350		
Thr	Gly	Leu	Gly	Ile	Phe	Arg	Thr	Leu	Ser	Ser	Pro	Leu	Tyr	Arg	Arg
	355					360						365			
Ile	Ile	Leu	Gly	Ser	Gly	Pro	Asn	Asn	Gln	Glu	Leu	Phe	Val	Leu	Asp
	370				375					380					
Gly	Thr	Glu	Phe	Ser	Phe	Ala	Ser	Leu	Thr	Thr	Asn	Leu	Pro	Ser	Thr
385					390					395				400	
Ile	Tyr	Arg	Gln	Arg	Gly	Thr	Val	Asp	Ser	Leu	Asp	Val	Ile	Pro	Pro
			405					410					415		
Gln	Asp	Asn	Ser	Val	Pro	Pro	Arg	Ala	Gly	Phe	Ser	His	Arg	Leu	Ser
		420					425					430			
His	Val	Thr	Met	Leu	Ser	Gln	Ala	Ala	Gly	Ala	Val	Tyr	Thr	Leu	Arg
	435					440					445				
Ala	Pro	Thr	Phe	Ser	Trp	Gln	His	Arg	Ser	Ala	Glu	Phe	Asn	Asn	Ile
	450				455					460					
Ile	Pro	Ser	Ser	Gln	Ile	Thr	Gln	Ile	Pro	Leu	Thr	Lys	Ser	Thr	Asn
465				470					475					480	
Leu	Gly	Ser	Gly	Thr	Ser	Val	Val	Lys	Gly	Pro	Gly	Phe	Thr	Gly	Gly
			485					490					495		
Asp	Ile	Leu	Arg	Arg	Thr	Ser	Pro	Gly	Gln	Ile	Ser	Thr	Leu	Arg	Val
		500					505					510			
Asn	Ile	Thr	Ala	Pro	Leu	Ser	Gln	Arg	Tyr	Arg	Val	Arg	Ile	Arg	Tyr
	515					520					525				
Ala	Ser	Thr	Thr	Asn	Leu	Gln	Phe	His	Thr	Ser	Ile	Asp	Gly	Arg	Pro
	530				535					540					
Ile	Asn	Gln	Gly	Asn	Phe	Ser	Ala	Thr	Met	Ser	Ser	Gly	Ser	Asn	Leu
545				550					555					560	
Gln	Ser	Gly	Ser	Phe	Arg	Thr	Val	Gly	Phe	Thr	Thr	Pro	Phe	Asn	Phe
			565					570					575		
Ser	Asn	Gly	Ser	Ser	Val	Phe	Thr	Leu	Ser	Ala	His	Val	Phe	Asn	Ser
		580					585					590			
Gly	Asn	Glu	Val	Tyr	Ile	Asp	Arg	Ile	Glu	Phe	Val	Pro	Ala	Glu	Val
	595					600					605				
Thr	Phe	Glu	Ala	Glu	Tyr	Asp	Leu	Glu	Arg	Ala	Gln	Lys	Ala	Val	Asn
	610				615					620					
Glu	Leu	Phe	Thr	Ser	Ser	Asn	Gln	Ile	Gly	Leu	Lys	Thr	Asp	Val	Thr
625				630					635					640	
Asp	Tyr	His	Ile	Asp	Gln	Val	Ser	Asn	Leu	Val	Glu	Cys	Leu	Ser	Asp
			645					650					655		
Glu	Phe	Cys	Leu	Asp	Glu	Lys	Gln	Glu	Leu	Ser	Glu	Lys	Val	Lys	His
		660					665					670			
Ala	Lys	Arg	Leu	Ser	Asp	Glu	Arg	Asn	Leu	Leu	Gln	Asp	Pro	Asn	Phe
	675					680					685				

Arg	Gly	Ile	Asn	Arg	Gln	Leu	Asp	Arg	Gly	Trp	Arg	Gly	Ser	Thr	Asp	
690						695				700						
Ile	Thr	Ile	Gln	Gly	Gly	Asp	Asp	Val	Phe	Lys	Glu	Asn	Tyr	Val	Thr	
705					710					715					720	
Leu	Leu	Gly	Thr	Phe	Asp	Glu	Cys	Tyr	Pro	Thr	Tyr	Leu	Tyr	Gln	Lys	
				725					730						735	
Ile	Asp	Glu	Ser	Lys	Leu	Lys	Ala	Tyr	Thr	Arg	Tyr	Gln	Leu	Arg	Gly	
			740					745					750			
Tyr	Ile	Glu	Asp	Ser	Gln	Asp	Leu	Glu	Ile	Tyr	Leu	Ile	Arg	Tyr	Asn	
	755						760					765				
Ala	Lys	His	Glu	Thr	Val	Asn	Val	Pro	Gly	Thr	Gly	Ser	Leu	Trp	Pro	
	770					775					780					
Leu	Ser	Ala	Gln	Ser	Pro	Ile	Gly	Lys	Cys	Gly	Glu	Pro	Asn	Arg	Cys	
785					790					795					800	
Ala	Pro	His	Leu	Glu	Trp	Asn	Pro	Asp	Leu	Asp	Cys	Ser	Cys	Arg	Asp	
				805					810						815	
Gly	Glu	Lys	Cys	Ala	His	His	Ser	His	His	Phe	Ser	Leu	Asp	Ile	Asp	
			820					825					830			
Val	Gly	Cys	Thr	Asp	Leu	Asn	Glu	Asp	Leu	Gly	Val	Trp	Val	Ile	Phe	
	835						840					845				
Lys	Ile	Lys	Thr	Gln	Asp	Gly	His	Ala	Arg	Leu	Gly	Asn	Leu	Glu	Phe	
	850					855					860					
Leu	Glu	Glu	Lys	Pro	Leu	Val	Gly	Glu	Ala	Leu	Ala	Arg	Val	Lys	Arg	
865					870					875					880	
Ala	Glu	Lys	Lys	Trp	Arg	Asp	Lys	Arg	Glu	Lys	Leu	Glu	Trp	Glu	Thr	
				885					890						895	
Asn	Ile	Val	Tyr	Lys	Glu	Ala	Lys	Glu	Ser	Val	Asp	Ala	Leu	Phe	Val	
		900						905					910			
Asn	Ser	Gln	Tyr	Asp	Gln	Leu	Gln	Ala	Asp	Thr	Asn	Ile	Ala	Met	Ile	
	915						920						925			
His	Ala	Ala	Asp	Lys	Arg	Val	His	Ser	Ile	Arg	Glu	Ala	Tyr	Leu	Pro	
	930					935						940				
Glu	Leu	Ser	Val	Ile	Pro	Gly	Val	Asn	Ala	Ala	Ile	Phe	Glu	Glu	Leu	
945					950					955					960	
Glu	Gly	Arg	Ile	Phe	Thr	Ala	Phe	Ser	Leu	Tyr	Asp	Ala	Arg	Asn	Val	
				965					970						975	
Ile	Lys	Asn	Gly	Asp	Phe	Asn	Asn	Gly	Leu	Ser	Cys	Trp	Asn	Val	Lys	
			980					985						990		
Gly	His	Val	Asp	Val	Glu	Glu	Gln	Asn	Asn	Gln	Arg	Ser	Val	Leu	Val	
	995						1000					1005				
Val	Pro	Glu	Trp	Glu	Ala	Glu	Val	Ser	Gln	Glu	Val	Arg	Val	Cys	Pro	
	1010					1015					1020					
Gly	Arg	Gly	Tyr	Ile	Leu	Arg	Val	Thr	Ala	Tyr	Lys	Glu	Gly	Tyr	Gly	
1025					1030					1035					1040	
Glu	Gly	Cys	Val	Thr	Ile	His	Glu	Ile	Glu	Asn	Asn	Thr	Asp	Glu	Leu	
				1045					1050					1055		
Lys	Phe	Ser	Asn	Cys	Val	Glu	Glu	Glu	Ile	Tyr	Pro	Asn	Asn	Thr	Val	
		1060						1065					1070			
Thr	Cys	Asn	Asp	Tyr	Thr	Val	Asn	Gln	Glu	Glu	Tyr	Gly	Gly	Ala	Tyr	
	1075						1080					1085				
Thr	Ser	Arg	Asn	Arg	Gly	Tyr	Asn	Glu	Ala	Pro	Ser	Val	Pro	Ala	Asp	
	1090					1095					1100					
Tyr	Ala	Ser	Val	Tyr	Glu	Glu	Lys	Ser	Tyr	Thr	Asp	Gly	Arg	Arg	Glu	
1105					1110					1115					1120	
Asn	Pro	Cys	Glu	Phe	Asn	Arg	Gly	Tyr	Arg	Asp	Tyr	Thr	Pro	Leu	Pro	
				1125					1130					1135		
Val	Gly	Tyr	Val	Thr	Lys	Glu	Leu	Glu	Tyr	Phe	Pro	Glu	Thr	Asp	Lys	

	1140		1145		1150										
Val	Trp	Ile	Glu	Ile	Gly	Glu	Thr	Glu	Gly	Thr	Phe	Ile	Val	Asp	Ser
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Val	Glu	Leu	Leu	Leu	Met	Glu	Glu								
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 <212> PRT  
 <213> *Bacillus thuringiensis*

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 Tyr Thr Pro Ile Asp Ile Ser Leu Ser Leu Thr Gln Phe Leu Leu Ser  
 35 40 45  
 Glu Phe Val Pro Gly Ala Gly Phe Val Leu Gly Leu Val Asp Ile Ile  
 50 55 60  
 Trp Gly Ile Phe Gly Pro Ser Gln Trp Asp Ala Phe Leu Val Gln Ile  
 65 70 75 80  
 Glu Gln Leu Ile Asn Gln Arg Ile Glu Glu Phe Ala Arg Asn Gln Ala  
 85 90 95  
 Ile Ser Arg Leu Glu Gly Leu Ser Asn Leu Tyr Gln Ile Tyr Ala Glu  
 100 105 110  
 Ser Phe Arg Glu Trp Glu Ala Asp Pro Thr Asn Pro Ala Leu Arg Glu  
 115 120 125  
 Glu Met Arg Ile Gln Phe Asn Asp Met Asn Ser Ala Leu Thr Thr Ala  
 130 135 140  
 Ile Pro Leu Phe Ala Val Gln Asn Tyr Gln Val Pro Leu Leu Ser Val  
 145 150 155 160  
 Tyr Val Gln Ala Ala Asn Leu His Leu Ser Val Leu Arg Asp Val Ser  
 165 170 175  
 Val Phe Gly Gln Arg Trp Gly Phe Asp Ala Ala Thr Ile Asn Ser Arg  
 180 185 190  
 Tyr Asn Asp Leu Thr Arg Leu Ile Gly Asn Tyr Thr Asp Tyr Ala Val  
 195 200 205  
 Arg Trp Tyr Asn Thr Gly Leu Glu Arg Val Trp Gly Pro Asp Ser Arg  
 210 215 220  
 Asp Trp Val Arg Tyr Asn Gln Phe Arg Arg Glu Leu Thr Leu Thr Val  
 225 230 235 240  
 Leu Asp Ile Val Ala Leu Phe Pro Asn Tyr Asp Ser Arg Arg Tyr Pro  
 245 250 255  
 Ile Arg Thr Val Ser Gln Leu Thr Arg Glu Ile Tyr Thr Asn Pro Val  
 260 265 270  
 Leu Glu Asn Phe Asp Gly Ser Phe Arg Gly Ser Ala Gln Gly Ile Glu  
 275 280 285  
 Arg Ser Ile Arg Ser Pro His Leu Met Asp Ile Leu Asn Ser Ile Thr  
 290 295 300  
 Ile Tyr Thr Asp Ala His Arg Gly Tyr Tyr Tyr Trp Ser Gly His Gln  
 305 310 315 320  
 Ile Met Ala Ser Pro Val Gly Phe Ser Gly Pro Glu Phe Thr Phe Pro  
 325 330 335  
 Leu Tyr Gly Thr Met Gly Asn Ala Ala Pro Gln Gln Arg Ile Val Ala  
 340 345 350

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				805					810					815			
Arg	Asp	Gly	Glu	Lys	Cys	Ala	His	His	Ser	His	His	Phe	Ser	Leu	Asp		
			820						825					830			
Ile	Asp	Val	Gly	Cys	Thr	Asp	Leu	Asn	Glu	Asp	Leu	Gly	Val	Trp	Val		
		835						840					845				
Ile	Phe	Lys	Ile	Lys	Thr	Gln	Asp	Gly	His	Ala	Arg	Leu	Gly	Asn	Leu		
	850					855					860						
Glu	Phe	Leu	Glu	Glu	Lys	Pro	Leu	Val	Gly	Glu	Ala	Leu	Ala	Arg	Val		
865					870					875					880		
Lys	Arg	Ala	Glu	Lys	Trp	Arg	Asp	Lys	Arg	Glu	Lys	Leu	Glu	Trp			
			885						890					895			
Glu	Thr	Asn	Ile	Val	Tyr	Lys	Glu	Ala	Lys	Glu	Ser	Val	Asp	Ala	Leu		
		900						905					910				
Phe	Val	Asn	Ser	Gln	Tyr	Asp	Gln	Leu	Gln	Ala	Asp	Thr	Asn	Ile	Ala		
	915						920					925					
Met	Ile	His	Ala	Ala	Asp	Lys	Arg	Val	His	Ser	Ile	Arg	Glu	Ala	Tyr		
	930					935					940						
Leu	Pro	Glu	Leu	Ser	Val	Ile	Pro	Gly	Val	Asn	Ala	Ala	Ile	Phe	Glu		
945					950					955					960		
Glu	Leu	Glu	Gly	Arg	Ile	Phe	Thr	Ala	Phe	Ser	Leu	Tyr	Asp	Ala	Arg		
			965						970					975			
Asn	Val	Ile	Lys	Asn	Gly	Asp	Phe	Asn	Asn	Gly	Leu	Ser	Cys	Trp	Asn		
		980						985					990				
Val	Lys	Gly	His	Val	Asp	Val	Glu	Glu	Gln	Asn	Asn	Gln	Arg	Ser	Val		
	995						1000					1005					
Leu	Val	Val	Pro	Glu	Trp	Glu	Ala	Glu	Val	Ser	Gln	Glu	Val	Arg	Val		
	1010					1015					1020						
Cys	Pro	Gly	Arg	Gly	Tyr	Ile	Leu	Arg	Val	Thr	Ala	Tyr	Lys	Glu	Gly		
1025					1030					1035				1040			
Tyr	Gly	Glu	Gly	Cys	Val	Thr	Ile	His	Glu	Ile	Glu	Asn	Asn	Thr	Asp		
			1045						1050					1055			
Glu	Leu	Lys	Phe	Ser	Asn	Cys	Val	Glu	Glu	Glu	Ile	Tyr	Pro	Asn	Asn		
		1060						1065				1070					
Thr	Val	Thr	Cys	Asn	Asp	Tyr	Thr	Val	Asn	Gln	Glu	Glu	Tyr	Gly	Gly		
	1075						1080					1085					
Ala	Tyr	Thr	Ser	Arg	Asn	Arg	Gly	Tyr	Asn	Glu	Ala	Pro	Ser	Val	Pro		
	1090					1095					1100						
Ala	Asp	Tyr	Ala	Ser	Val	Tyr	Glu	Glu	Lys	Ser	Tyr	Thr	Asp	Gly	Arg		
1105					1110					1115				1120			
Arg	Glu	Asn	Pro	Cys	Glu	Phe	Asn	Arg	Gly	Tyr	Arg	Asp	Tyr	Thr	Pro		
			1125						1130					1135			
Leu	Pro	Val	Gly	Tyr	Val	Thr	Lys	Glu	Leu	Glu	Tyr	Phe	Pro	Glu	Thr		
		1140						1145				1150					
Asp	Lys	Val	Trp	Ile	Glu	Ile	Gly	Glu	Thr	Glu	Gly	Thr	Phe	Ile	Val		
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Asp	Ser	Val	Glu	Leu	Leu	Leu	Met	Glu	Glu								
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<211> 719

<212> PRT

<213> Bacillus thuringiensis

<400> 10

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			20					25					30		
Glu	Leu	Gln	Asn	Ile	Asn	His	Glu	Asp	Cys	Leu	Lys	Met	Ser	Glu	Tyr
		35					40					45			
Glu	Asn	Val	Glu	Pro	Phe	Val	Ser	Ala	Ser	Thr	Ile	Gln	Thr	Gly	Ile
		50				55					60				
Gly	Ile	Ala	Gly	Lys	Ile	Leu	Gly	Thr	Leu	Gly	Val	Pro	Phe	Ala	Gly
65					70					75					80
Gln	Val	Ala	Ser	Leu	Tyr	Ser	Phe	Ile	Leu	Gly	Glu	Leu	Trp	Pro	Lys
			85						90					95	
Gly	Lys	Asn	Gln	Trp	Glu	Ile	Phe	Met	Glu	His	Val	Glu	Glu	Ile	Ile
			100					105					110		
Asn	Gln	Lys	Ile	Ser	Thr	Tyr	Ala	Arg	Asn	Lys	Ala	Leu	Thr	Asp	Leu
		115					120					125			
Lys	Gly	Leu	Gly	Asp	Ala	Leu	Ala	Val	Tyr	His	Asp	Ser	Leu	Glu	Ser
		130				135					140				
Trp	Val	Gly	Asn	Arg	Asn	Asn	Thr	Arg	Ala	Arg	Ser	Val	Val	Lys	Ser
145					150					155					160
Gln	Tyr	Ile	Ala	Leu	Glu	Leu	Met	Phe	Val	Gln	Lys	Leu	Pro	Ser	Phe
				165					170					175	
Ala	Val	Ser	Gly	Glu	Glu	Val	Pro	Leu	Leu	Pro	Ile	Tyr	Ala	Gln	Ala
			180					185					190		
Ala	Asn	Leu	His	Leu	Leu	Leu	Leu	Arg	Asp	Ala	Ser	Ile	Phe	Gly	Lys
		195					200					205			
Glu	Trp	Gly	Leu	Ser	Ser	Ser	Glu	Ile	Ser	Thr	Phe	Tyr	Asn	Arg	Gln
		210				215					220				
Val	Glu	Arg	Ala	Gly	Asp	Tyr	Ser	Asp	His	Cys	Val	Lys	Trp	Tyr	Ser
225					230					235					240
Thr	Gly	Leu	Asn	Asn	Leu	Arg	Gly	Thr	Asn	Ala	Glu	Ser	Trp	Val	Arg
			245						250					255	
Tyr	Asn	Gln	Phe	Arg	Arg	Asp	Met	Thr	Leu	Met	Val	Leu	Asp	Leu	Val
		260					265						270		
Ala	Leu	Phe	Pro	Ser	Tyr	Asp	Thr	Gln	Met	Tyr	Pro	Ile	Lys	Thr	Thr
		275					280					285			
Ala	Gln	Leu	Thr	Arg	Glu	Val	Tyr	Thr	Asp	Ala	Ile	Gly	Thr	Val	His
		290				295					300				
Pro	His	Pro	Ser	Phe	Thr	Ser	Thr	Thr	Trp	Tyr	Asn	Asn	Asn	Ala	Pro
305					310					315					320
Ser	Phe	Ser	Ala	Ile	Glu	Ala	Ala	Val	Val	Arg	Asn	Pro	His	Leu	Leu
				325					330					335	
Asp	Phe	Leu	Glu	Gln	Val	Thr	Ile	Tyr	Ser	Leu	Leu	Ser	Arg	Trp	Ser
			340					345					350		
Asn	Thr	Gln	Tyr	Met	Asn	Met	Trp	Gly	Gly	His	Lys	Leu	Glu	Phe	Arg
		355				360						365			
Thr	Ile	Gly	Gly	Thr	Leu	Asn	Ile	Ser	Thr	Gln	Gly	Ser	Thr	Asn	Thr
		370				375					380				
Ser	Ile	Asn	Pro	Val	Thr	Leu	Pro	Phe	Thr	Ser	Arg	Asp	Val	Tyr	Arg
385					390					395					400
Thr	Glu	Ser	Leu	Ala	Gly	Leu	Asn	Leu	Phe	Leu	Thr	Gln	Pro	Val	Asn
				405					410					415	
Gly	Val	Pro	Arg	Val	Asp	Phe	His	Trp	Lys	Phe	Val	Thr	His	Pro	Ile
			420					425					430		
Ala	Ser	Asp	Asn	Phe	Tyr	Tyr	Pro	Gly	Tyr	Ala	Gly	Ile	Gly	Thr	Gln
		435					440					445			
Leu	Gln	Asp	Ser	Glu	Asn	Glu	Leu	Pro	Pro	Glu	Ala	Thr	Gly	Gln	Pro
		450				455					460				
Asn	Tyr	Glu	Ser	Tyr	Ser	His	Arg	Leu	Ser	His	Ile	Gly	Leu	Ile	Ser

465					470					475				480	
Ala	Ser	His	Val	Lys	Ala	Leu	Val	Tyr	Ser	Trp	Thr	His	Arg	Ser	Ala
				485					490					495	
Asp	Arg	Thr	Asn	Thr	Ile	Glu	Pro	Asn	Ser	Ile	Thr	Gln	Ile	Pro	Leu
			500					505					510		
Val	Lys	Ala	Phe	Asn	Leu	Ser	Ser	Gly	Ala	Ala	Val	Val	Arg	Gly	Pro
		515					520					525			
Gly	Phe	Thr	Gly	Gly	Asp	Ile	Leu	Arg	Arg	Thr	Asn	Thr	Gly	Thr	Phe
	530					535					540				
Gly	Asp	Ile	Arg	Val	Asn	Ile	Asn	Pro	Pro	Phe	Ala	Gln	Arg	Tyr	Arg
545					550					555					560
Val	Arg	Ile	Arg	Tyr	Ala	Ser	Thr	Thr	Asp	Leu	Gln	Phe	His	Thr	Ser
				565					570					575	
Ile	Asn	Gly	Lys	Ala	Ile	Asn	Gln	Gly	Asn	Phe	Ser	Ala	Thr	Met	Asn
			580					585					590		
Arg	Gly	Glu	Asp	Leu	Asp	Tyr	Lys	Thr	Phe	Arg	Thr	Val	Gly	Phe	Thr
		595					600					605			
Thr	Pro	Phe	Ser	Phe	Leu	Asp	Val	Gln	Ser	Thr	Phe	Thr	Ile	Gly	Ala
	610					615					620				
Trp	Asn	Phe	Ser	Ser	Gly	Asn	Glu	Val	Tyr	Ile	Asp	Arg	Ile	Glu	Phe
625					630					635					640
Val	Pro	Val	Glu	Val	Thr	Tyr	Glu	Ala	Glu	Tyr	Asp	Phe	Glu	Lys	Ala
				645					650					655	
Gln	Glu	Lys	Val	Thr	Ala	Leu	Phe	Thr	Ser	Thr	Asn	Pro	Arg	Gly	Leu
			660					665					670		
Lys	Thr	Asp	Val	Lys	Asp	Tyr	His	Ile	Asp	Gln	Val	Ser	Asn	Leu	Val
		675					680					685			
Glu	Ser	Leu	Ser	Asp	Glu	Phe	Tyr	Leu	Asp	Glu	Lys	Arg	Glu	Leu	Phe
	690					695					700				
Glu	Ile	Val	Lys	Tyr	Ala	Lys	Gln	Leu	His	Ile	Glu	Arg	Asn	Met	
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 <212> PRT  
 <213> Bacillus thuringiensis

<400> 11															
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Asn	Val	Val	Ala	His	Asp	Pro	Phe	Ser	Phe	Glu	His	Lys	Ser	Leu	Asp
			20					25					30		
Thr	Ile	Gln	Lys	Glu	Trp	Met	Glu	Trp	Lys	Arg	Thr	Asp	His	Ser	Leu
	35					40						45			
Tyr	Val	Ala	Pro	Val	Val	Gly	Thr	Val	Ser	Ser	Phe	Leu	Leu	Lys	Lys
	50					55					60				
Val	Gly	Ser	Leu	Ile	Gly	Lys	Arg	Ile	Leu	Ser	Glu	Leu	Trp	Gly	Ile
65					70					75					80
Ile	Phe	Pro	Ser	Gly	Ser	Thr	Asn	Leu	Met	Gln	Asp	Ile	Leu	Arg	Glu
				85					90					95	
Thr	Glu	Gln	Phe	Leu	Asn	Gln	Arg	Leu	Asn	Thr	Asp	Thr	Leu	Ala	Arg
			100					105					110		
Val	Asn	Ala	Glu	Leu	Ile	Gly	Leu	Gln	Ala	Asn	Ile	Arg	Glu	Phe	Asn
		115					120					125			
Gln	Gln	Val	Asp	Asn	Phe	Leu	Asn	Pro	Thr	Gln	Asn	Pro	Val	Pro	Leu
	130					135					140				



Ser	Ile	Thr	Ser	Ser	Val	Asn	Thr	Met	Gln	Gln	Leu	Phe	Leu	Asn	Arg
145					150				155					160	
Leu	Pro	Gln	Phe	Gln	Ile	Gln	Gly	Tyr	Gln	Leu	Leu	Leu	Leu	Pro	Leu
				165					170					175	
Phe	Ala	Gln	Ala	Ala	Asn	Met	His	Leu	Ser	Phe	Ile	Arg	Asp	Val	Ile
			180					185					190		
Leu	Asn	Ala	Asp	Glu	Trp	Gly	Ile	Ser	Ala	Ala	Thr	Leu	Arg	Thr	Tyr
		195					200					205			
Arg	Asp	Tyr	Leu	Arg	Asn	Tyr	Thr	Arg	Asp	Tyr	Ser	Asn	Tyr	Cys	Ile
	210					215					220				
Asn	Thr	Tyr	Gln	Thr	Ala	Phe	Arg	Gly	Leu	Asn	Thr	Arg	Leu	His	Asp
225					230				235					240	
Met	Leu	Glu	Phe	Arg	Thr	Tyr	Met	Phe	Leu	Asn	Val	Phe	Glu	Tyr	Val
			245					250					255		
Ser	Ile	Trp	Ser	Leu	Phe	Lys	Tyr	Gln	Ser	Leu	Met	Val	Ser	Ser	Gly
			260					265					270		
Ala	Asn	Leu	Tyr	Ala	Ser	Gly	Ser	Gly	Pro	Gln	Gln	Thr	Gln	Ser	Phe
		275					280					285			
Thr	Ala	Gln	Asn	Trp	Pro	Phe	Leu	Tyr	Ser	Leu	Phe	Gln	Val	Asn	Ser
	290					295					300				
Asn	Tyr	Ile	Leu	Ser	Gly	Ile	Ser	Gly	Thr	Arg	Leu	Ser	Ile	Thr	Phe
305					310				315					320	
Pro	Asn	Ile	Gly	Gly	Leu	Pro	Gly	Ser	Thr	Thr	Thr	His	Ser	Leu	Asn
			325					330					335		
Ser	Ala	Arg	Val	Asn	Tyr	Ser	Gly	Gly	Val	Ser	Ser	Gly	Leu	Ile	Gly
			340					345					350		
Ala	Thr	Asn	Leu	Asn	His	Asn	Phe	Asn	Cys	Ser	Thr	Val	Leu	Pro	Pro
		355					360					365			
Leu	Ser	Thr	Pro	Phe	Val	Arg	Ser	Trp	Leu	Asp	Ser	Gly	Thr	Asp	Arg
	370					375					380				
Glu	Gly	Val	Ala	Thr	Ser	Thr	Asn	Trp	Gln	Thr	Glu	Ser	Phe	Gln	Thr
385					390				395					400	
Thr	Leu	Ser	Leu	Arg	Cys	Gly	Ala	Phe	Ser	Ala	Arg	Gly	Asn	Ser	Asn
				405				410					415		
Tyr	Phe	Pro	Asp	Tyr	Phe	Ile	Arg	Asn	Ile	Ser	Gly	Val	Pro	Leu	Val
			420					425					430		
Ile	Arg	Asn	Glu	Asp	Leu	Thr	Arg	Pro	Leu	His	Tyr	Asn	Gln	Ile	Arg
		435					440					445			
Asn	Ile	Glu	Ser	Pro	Ser	Gly	Thr	Pro	Gly	Gly	Ala	Arg	Ala	Tyr	Leu
	450					455					460				
Val	Ser	Val	His	Asn	Arg	Lys	Asn	Asn	Ile	Tyr	Ala	Ala	Asn	Glu	Asn
465					470				475					480	
Gly	Thr	Met	Ile	His	Leu	Ala	Pro	Glu	Asp	Tyr	Thr	Gly	Phe	Thr	Ile
				485				490					495		
Ser	Pro	Ile	His	Ala	Thr	Gln	Val	Asn	Asn	Gln	Thr	Arg	Thr	Phe	Ile
			500					505					510		
Ser	Glu	Lys	Phe	Gly	Asn	Gln	Gly	Asp	Ser	Leu	Arg	Phe	Glu	Gln	Ser
		515					520					525			
Asn	Thr	Thr	Ala	Arg	Tyr	Thr	Leu	Arg	Gly	Asn	Gly	Asn	Ser	Tyr	Asn
	530					535					540				
Leu	Tyr	Leu	Arg	Val	Ser	Ser	Ile	Gly	Asn	Ser	Thr	Ile	Arg	Val	Thr
545					550				555					560	
Ile	Asn	Gly	Arg	Val	Tyr	Thr	Val	Ser	Asn	Val	Asn	Thr	Thr	Thr	Asn
				565				570					575		
Asn	Asp	Gly	Val	Asn	Asp	Asn	Gly	Ala	Arg	Phe	Ser	Asp	Ile	Asn	Ile
			580					585				590			
Gly	Asn	Ile	Val	Ala	Ser	Asp	Asn	Thr	Asn	Val	Thr	Leu	Asp	Ile	Asn

	595						600					605					
Val	Thr	Leu	Asn	Ser	Gly	Thr	Pro	Phe	Asp	Leu	Met	Asn	Ile	Met	Phe		
	610						615					620					
Val	Pro	Thr	Asn	Leu	Pro	Pro	Leu	Tyr									
625							630										

<210> 12  
 <211> 652  
 <212> PRT  
 <213> *Bacillus thuringiensis*

<400> 12

Met	Ile	Arg	Lys	Gly	Gly	Arg	Lys	Met	Asn	Pro	Asn	Asn	Arg	Ser	Glu		
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His	Asp	Thr	Ile	Lys	Thr	Thr	Glu	Asn	Asn	Glu	Val	Pro	Thr	Asn	His		
			20					25					30				
Val	Gln	Tyr	Pro	Leu	Ala	Glu	Thr	Pro	Asn	Pro	Thr	Leu	Glu	Asp	Leu		
	35					40						45					
Asn	Tyr	Lys	Glu	Phe	Leu	Arg	Met	Thr	Ala	Asp	Asn	Asn	Thr	Glu	Ala		
	50					55					60						
Leu	Asp	Ser	Ser	Thr	Thr	Lys	Asp	Val	Ile	Gln	Lys	Gly	Ile	Ser	Val		
65					70					75					80		
Val	Gly	Asp	Leu	Leu	Gly	Val	Val	Gly	Phe	Pro	Phe	Gly	Gly	Ala	Leu		
				85					90					95			
Val	Ser	Phe	Tyr	Thr	Asn	Phe	Leu	Asn	Thr	Ile	Trp	Pro	Ser	Glu	Asp		
			100					105					110				
Pro	Trp	Lys	Ala	Phe	Met	Glu	Gln	Val	Glu	Ala	Leu	Met	Asp	Gln	Lys		
	115					120						125					
Ile	Ala	Asp	Tyr	Ala	Lys	Asn	Lys	Ala	Leu	Ala	Glu	Leu	Gln	Gly	Leu		
	130					135					140						
Gln	Asn	Asn	Val	Glu	Asp	Tyr	Val	Ser	Ala	Leu	Ser	Ser	Trp	Gln	Lys		
145					150					155					160		
Asn	Pro	Val	Ser	Ser	Arg	Asn	Pro	His	Ser	Gln	Gly	Arg	Ile	Arg	Glu		
				165					170					175			
Leu	Phe	Ser	Gln	Ala	Glu	Ser	His	Phe	Arg	Asn	Ser	Met	Pro	Ser	Phe		
			180					185					190				
Ala	Ile	Ser	Gly	Tyr	Glu	Val	Leu	Phe	Leu	Thr	Thr	Tyr	Ala	Gln	Ala		
	195						200					205					
Ala	Asn	Thr	His	Leu	Phe	Leu	Leu	Lys	Asp	Ala	Gln	Ile	Tyr	Gly	Glu		
	210					215					220						
Glu	Trp	Gly	Tyr	Glu	Lys	Glu	Asp	Ile	Ala	Glu	Phe	Tyr	Lys	Arg	Gln		
225					230					235					240		
Leu	Lys	Leu	Thr	Gln	Glu	Tyr	Thr	Asp	His	Cys	Val	Lys	Trp	Tyr	Asn		
				245					250					255			
Val	Gly	Leu	Asp	Lys	Leu	Arg	Gly	Ser	Ser	Tyr	Glu	Ser	Trp	Val	Asn		
			260					265					270				
Phe	Asn	Arg	Tyr	Arg	Arg	Glu	Met	Thr	Leu	Thr	Val	Leu	Asp	Leu	Ile		
	275						280						285				
Ala	Leu	Phe	Pro	Leu	Tyr	Asp	Val	Arg	Leu	Tyr	Pro	Lys	Glu	Val	Lys		
	290					295					300						
Thr	Glu	Leu	Thr	Arg	Asp	Val	Leu	Thr	Asp	Pro	Ile	Val	Gly	Val	Asn		
305					310					315					320		
Asn	Leu	Arg	Gly	Tyr	Gly	Thr	Thr	Phe	Ser	Asn	Ile	Glu	Asn	Tyr	Ile		
			325						330					335			
Arg	Lys	Pro	His	Leu	Phe	Asp	Tyr	Leu	His	Arg	Ile	Gln	Phe	His	Thr		
			340					345					350				

Arg	Phe	Gln	Pro	Gly	Tyr	Tyr	Gly	Asn	Asp	Ser	Phe	Asn	Tyr	Trp	Ser
		355					360					365			
Gly	Asn	Tyr	Val	Ser	Thr	Arg	Pro	Ser	Ile	Gly	Ser	Asn	Asp	Ile	Ile
		370					375				380				
Thr	Ser	Pro	Phe	Tyr	Gly	Asn	Lys	Ser	Ser	Glu	Pro	Val	Gln	Asn	Leu
385					390					395					400
Glu	Phe	Asn	Gly	Glu	Lys	Val	Tyr	Arg	Ala	Val	Ala	Asn	Thr	Asn	Leu
			405						410					415	
Ala	Val	Trp	Pro	Ser	Ala	Val	Tyr	Ser	Gly	Val	Thr	Lys	Val	Glu	Phe
			420					425					430		
Ser	Gln	Tyr	Asn	Asp	Gln	Thr	Asp	Glu	Ala	Ser	Thr	Gln	Thr	Tyr	Asp
		435					440					445			
Ser	Lys	Arg	Asn	Val	Gly	Ala	Val	Ser	Trp	Asp	Ser	Ile	Asp	Gln	Leu
		450				455					460				
Pro	Pro	Glu	Thr	Thr	Asp	Glu	Pro	Leu	Glu	Lys	Gly	Tyr	Ser	His	Gln
465					470					475					480
Leu	Asn	Tyr	Val	Met	Cys	Phe	Leu	Met	Gln	Gly	Ser	Arg	Gly	Thr	Ile
				485					490					495	
Pro	Val	Leu	Thr	Trp	Thr	His	Lys	Ser	Val	Asp	Phe	Phe	Asn	Met	Ile
			500					505					510		
Asp	Ser	Lys	Lys	Ile	Thr	Gln	Leu	Pro	Leu	Val	Lys	Ala	Tyr	Lys	Leu
		515					520					525			
Gln	Ser	Gly	Ala	Ser	Val	Val	Ala	Gly	Pro	Arg	Phe	Thr	Gly	Gly	Asp
		530				535					540				
Ile	Ile	Gln	Cys	Thr	Glu	Asn	Gly	Ser	Ala	Ala	Thr	Ile	Tyr	Val	Thr
545					550					555					560
Pro	Asp	Val	Ser	Tyr	Ser	Gln	Lys	Tyr	Arg	Ala	Arg	Ile	His	Tyr	Ala
				565					570					575	
Ser	Thr	Ser	Gln	Ile	Thr	Phe	Thr	Leu	Ser	Leu	Asp	Gly	Ala	Pro	Phe
			580					585					590		
Asn	Gln	Tyr	Tyr	Phe	Asp	Lys	Thr	Ile	Asn	Lys	Gly	Asp	Thr	Leu	Thr
		595					600					605			
Tyr	Asn	Ser	Phe	Asn	Leu	Ala	Ser	Phe	Ser	Thr	Pro	Phe	Glu	Leu	Ser
		610				615					620				
Gly	Asn	Asn	Leu	Gln	Ile	Gly	Val	Thr	Gly	Leu	Ser	Ala	Gly	Asp	Lys
625					630					635					640
Val	Tyr	Ile	Asp	Lys	Ile	Glu	Phe	Ile	Pro	Val	Asn				
				645					650						

<210> 13  
 <211> 652  
 <212> PRT  
 <213> Bacillus thuringiensis

<400> 13  
 Met Asn Pro Asn Asn Arg Ser Glu His Asp Thr Ile Lys Val Thr Pro  
 1 5 10 15  
 Asn Ser Glu Leu Gln Thr Asn His Asn Gln Tyr Pro Leu Ala Asp Asn  
 20 25 30  
 Pro Asn Ser Thr Leu Glu Glu Leu Asn Tyr Lys Glu Phe Leu Arg Met  
 35 40 45  
 Thr Glu Asp Ser Ser Thr Glu Val Leu Asp Asn Ser Thr Val Lys Asp  
 50 55 60  
 Ala Val Gly Thr Gly Ile Ser Val Val Gly Gln Ile Leu Gly Val Val  
 65 70 75 80  
 Gly Val Pro Phe Ala Gly Ala Leu Thr Ser Phe Tyr Gln Ser Phe Leu

				85				90				95				
Asn	Thr	Ile	Trp	Pro	Ser	Asp	Ala	Asp	Pro	Trp	Lys	Ala	Phe	Met	Ala	
100				105				110								
Gln	Val	Glu	Val	Leu	Ile	Asp	Lys	Lys	Ile	Glu	Glu	Tyr	Ala	Lys	Ser	
115				120				125								
Lys	Ala	Leu	Ala	Glu	Leu	Gln	Gly	Leu	Gln	Asn	Asn	Phe	Glu	Asp	Tyr	
130				135				140								
Val	Asn	Ala	Leu	Asn	Ser	Trp	Lys	Lys	Thr	Pro	Leu	Ser	Leu	Arg	Ser	
145					150				155				160			
Lys	Arg	Ser	Gln	Asp	Arg	Ile	Arg	Glu	Leu	Phe	Ser	Gln	Ala	Glu	Ser	
				165				170				175				
His	Phe	Arg	Asn	Ser	Met	Pro	Ser	Phe	Ala	Val	Ser	Lys	Phe	Glu	Val	
180				185				190								
Leu	Phe	Leu	Pro	Thr	Tyr	Ala	Gln	Ala	Ala	Asn	Thr	His	Leu	Leu	Leu	
195				200				205								
Leu	Lys	Asp	Ala	Gln	Val	Phe	Gly	Glu	Glu	Trp	Gly	Tyr	Ser	Ser	Glu	
210				215				220								
Asp	Val	Ala	Glu	Phe	Tyr	His	Arg	Gln	Leu	Lys	Leu	Thr	Gln	Gln	Tyr	
225					230				235				240			
Thr	Asp	His	Cys	Val	Asn	Trp	Tyr	Asn	Val	Gly	Leu	Asn	Gly	Leu	Arg	
				245				250				255				
Gly	Ser	Thr	Tyr	Asp	Ala	Trp	Val	Lys	Phe	Asn	Arg	Phe	Arg	Arg	Glu	
260				265				270								
Met	Thr	Leu	Thr	Val	Leu	Asp	Leu	Ile	Val	Leu	Phe	Pro	Phe	Tyr	Asp	
275				280				285								
Ile	Arg	Leu	Tyr	Ser	Lys	Gly	Val	Lys	Thr	Glu	Leu	Thr	Arg	Asp	Ile	
290				295				300								
Phe	Thr	Asp	Pro	Ile	Phe	Ser	Leu	Asn	Thr	Leu	Gln	Glu	Tyr	Gly	Pro	
305					310				315				320			
Thr	Phe	Leu	Ser	Ile	Glu	Asn	Ser	Ile	Arg	Lys	Pro	His	Leu	Phe	Asp	
				325				330				335				
Tyr	Leu	Gln	Gly	Ile	Glu	Phe	His	Thr	Arg	Leu	Gln	Pro	Gly	Tyr	Phe	
340				345				350								
Gly	Lys	Asp	Ser	Phe	Asn	Tyr	Trp	Ser	Gly	Asn	Tyr	Val	Glu	Thr	Arg	
355				360				365								
Pro	Ser	Ile	Gly	Ser	Ser	Lys	Thr	Ile	Thr	Ser	Pro	Phe	Tyr	Gly	Asp	
370				375				380								
Lys	Ser	Thr	Glu	Pro	Val	Gln	Lys	Leu	Ser	Phe	Asp	Gly	Gln	Lys	Val	
385					390				395				400			
Tyr	Arg	Thr	Ile	Ala	Asn	Thr	Asp	Val	Ala	Ala	Trp	Pro	Asn	Gly	Lys	
				405				410				415				
Val	Tyr	Leu	Gly	Val	Thr	Lys	Val	Asp	Phe	Ser	Gln	Tyr	Asp	Asp	Gln	
420				425				430								
Lys	Asn	Glu	Thr	Ser	Thr	Gln	Thr	Tyr	Asp	Ser	Lys	Arg	Asn	Asn	Gly	
435				440				445								
His	Val	Ser	Ala	Gln	Asp	Ser	Ile	Asp	Gln	Leu	Pro	Pro	Glu	Thr	Thr	
450				455				460								
Asp	Glu	Pro	Leu	Glu	Lys	Ala	Tyr	Ser	His	Gln	Leu	Asn	Tyr	Ala	Glu	
465					470				475				480			
Cys	Phe	Leu	Met	Gln	Asp	Arg	Arg	Gly	Thr	Ile	Pro	Phe	Phe	Thr	Trp	
				485				490				495				
Thr	His	Arg	Ser	Val	Asp	Phe	Phe	Asn	Thr	Ile	Asp	Ala	Glu	Lys	Ile	
500				505				510								
Thr	Gln	Leu	Pro	Val	Val	Lys	Ala	Tyr	Ala	Leu	Ser	Ser	Gly	Ala	Ser	
515				520				525								

Glu	Ser	Ser	Asn	Ser	Ile	Ala	Lys	Phe	Lys	Val	Thr	Leu	Asn	Ser	Ala
545					550				555						560
Ala	Leu	Leu	Gln	Arg	Tyr	Arg	Val	Arg	Ile	Arg	Tyr	Ala	Ser	Thr	Thr
				565					570						575
Asn	Leu	Arg	Leu	Phe	Val	Gln	Asn	Ser	Asn	Asn	Asp	Phe	Leu	Val	Ile
			580					585					590		
Tyr	Ile	Asn	Lys	Thr	Met	Asn	Lys	Asp	Asp	Asp	Leu	Thr	Tyr	Gln	Thr
		595					600					605			
Phe	Asp	Leu	Ala	Thr	Thr	Asn	Ser	Asn	Met	Gly	Phe	Ser	Gly	Asp	Lys
	610					615					620				
Asn	Glu	Leu	Ile	Ile	Gly	Ala	Glu	Ser	Phe	Val	Ser	Asn	Glu	Lys	Ile
625					630					635					640
Tyr	Ile	Asp	Lys	Ile	Glu	Phe	Ile	Pro	Val	Gln	Leu				
				645					650						

<210> 14

<211> 1180

<212> PRT

<213> *Bacillus thuringiensis*

<400> 14

Met	Asn	Pro	Tyr	Gln	Asn	Lys	Asn	Glu	Tyr	Glu	Thr	Leu	Asn	Ala	Ser
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Gln	Lys	Lys	Leu	Asn	Ile	Ser	Asn	Asn	Tyr	Thr	Arg	Tyr	Pro	Ile	Glu
			20					25					30		
Asn	Ser	Pro	Lys	Gln	Leu	Leu	Gln	Ser	Thr	Asn	Tyr	Lys	Asp	Trp	Leu
		35					40					45			
Asn	Met	Cys	Gln	Gln	Asn	Gln	Gln	Tyr	Gly	Gly	Asp	Phe	Glu	Thr	Phe
	50					55					60				
Ile	Asp	Ser	Gly	Glu	Leu	Ser	Ala	Tyr	Thr	Ile	Val	Val	Gly	Thr	Val
65					70					75					80
Leu	Thr	Gly	Phe	Gly	Phe	Thr	Thr	Pro	Leu	Gly	Leu	Ala	Leu	Ile	Gly
				85				90						95	
Phe	Gly	Thr	Leu	Ile	Pro	Val	Leu	Phe	Pro	Ala	Gln	Asp	Gln	Ser	Asn
			100					105					110		
Thr	Trp	Ser	Asp	Phe	Ile	Thr	Gln	Thr	Lys	Asn	Ile	Ile	Lys	Lys	Glu
		115					120					125			
Ile	Ala	Ser	Thr	Tyr	Ile	Ser	Asn	Ala	Asn	Lys	Ile	Leu	Asn	Arg	Ser
	130					135					140				
Phe	Asn	Val	Ile	Ser	Thr	Tyr	His	Asn	His	Leu	Lys	Thr	Trp	Glu	Asn
145					150					155					160
Asn	Pro	Asn	Pro	Gln	Asn	Thr	Gln	Asp	Val	Arg	Thr	Gln	Ile	Gln	Leu
				165					170					175	
Val	His	Tyr	His	Phe	Gln	Asn	Val	Ile	Pro	Glu	Leu	Val	Asn	Ser	Cys
			180					185					190		
Pro	Pro	Asn	Pro	Ser	Asp	Cys	Asp	Tyr	Tyr	Asn	Ile	Leu	Val	Leu	Ser
		195					200					205			
Ser	Tyr	Ala	Gln	Ala	Ala	Asn	Leu	His	Leu	Thr	Val	Leu	Asn	Gln	Ala
	210					215					220				
Val	Lys	Phe	Glu	Ala	Tyr	Leu	Lys	Asn	Asn	Arg	Gln	Phe	Asp	Tyr	Leu
225					230					235					240
Glu	Pro	Leu	Pro	Thr	Ala	Ile	Asp	Tyr	Tyr	Pro	Val	Leu	Thr	Lys	Ala
				245					250					255	
Ile	Glu	Asp	Tyr	Thr	Asn	Tyr	Cys	Val	Thr	Thr	Tyr	Lys	Lys	Gly	Leu
		260						265					270		
Asn	Leu	Ile	Lys	Thr	Thr	Pro	Asp	Ser	Asn	Leu	Asp	Gly	Asn	Ile	Asn



Lys	Met	Leu	Leu	Leu	Asp	Glu	Val	Lys	Asn	Ala	Lys	Gln	Leu	Ser	Gln	
		740						745				750				
Ser	Arg	Asn	Val	Leu	Gln	Asn	Gly	Asp	Phe	Glu	Ser	Ala	Thr	Leu	Gly	
		755					760					765				
Trp	Thr	Thr	Ser	Asp	Asn	Ile	Thr	Ile	Gln	Glu	Asp	Asp	Pro	Ile	Phe	
	770					775					780					
Lys	Gly	His	Tyr	Leu	His	Met	Ser	Gly	Ala	Arg	Asp	Ile	Asp	Gly	Thr	
785					790					795					800	
Ile	Phe	Pro	Thr	Tyr	Ile	Phe	Gln	Lys	Ile	Asp	Glu	Ser	Lys	Leu	Lys	
				805					810					815		
Pro	Tyr	Thr	Arg	Tyr	Leu	Val	Arg	Gly	Phe	Val	Gly	Ser	Ser	Lys	Asp	
			820					825					830			
Val	Glu	Leu	Val	Val	Ser	Arg	Tyr	Gly	Glu	Glu	Ile	Asp	Ala	Ile	Met	
		835					840					845				
Asn	Val	Pro	Ala	Asp	Leu	Asn	Tyr	Leu	Tyr	Pro	Ser	Thr	Phe	Asp	Cys	
	850					855					860					
Glu	Gly	Ser	Asn	Arg	Cys	Glu	Thr	Ser	Ala	Val	Pro	Ala	Asn	Ile	Gly	
865				870						875					880	
Asn	Thr	Ser	Asp	Met	Leu	Tyr	Ser	Cys	Gln	Tyr	Asp	Thr	Gly	Lys	Lys	
			885						890					895		
His	Val	Val	Cys	Gln	Asp	Ser	His	Gln	Phe	Ser	Phe	Thr	Ile	Asp	Thr	
			900					905					910			
Gly	Ala	Leu	Asp	Thr	Asn	Glu	Asn	Ile	Gly	Val	Trp	Val	Met	Phe	Lys	
		915				920						925				
Ile	Ser	Ser	Pro	Asp	Gly	Tyr	Ala	Ser	Leu	Asp	Asn	Leu	Glu	Val	Ile	
	930					935					940					
Glu	Glu	Gly	Pro	Ile	Asp	Gly	Glu	Ala	Leu	Ser	Arg	Val	Lys	His	Met	
945				950						955					960	
Glu	Lys	Lys	Trp	Asn	Asp	Gln	Met	Glu	Ala	Lys	Arg	Ser	Glu	Thr	Gln	
			965						970					975		
Gln	Ala	Tyr	Asp	Val	Ala	Lys	Gln	Ala	Ile	Asp	Ala	Leu	Phe	Thr	Asn	
			980					985					990			
Val	Gln	Asp	Glu	Ala	Leu	Gln	Phe	Asp	Thr	Thr	Leu	Ala	Gln	Ile	Gln	
		995					1000						1005			
Tyr	Ala	Glu	Tyr	Leu	Val	Gln	Ser	Ile	Pro	Tyr	Val	Tyr	Asn	Asp	Trp	
	1010					1015					1020					
Leu	Ser	Asp	Val	Pro	Gly	Met	Asn	Tyr	Asp	Ile	Tyr	Val	Glu	Leu	Asp	
1025				1030						1035					1040	
Ala	Arg	Val	Ala	Gln	Ala	Arg	Tyr	Leu	Tyr	Asp	Thr	Arg	Asn	Ile	Ile	
				1045					1050					1055		
Lys	Asn	Gly	Asp	Phe	Thr	Gln	Gly	Val	Met	Gly	Trp	His	Val	Thr	Gly	
			1060					1065					1070			
Asn	Ala	Asp	Val	Gln	Gln	Ile	Asp	Gly	Val	Ser	Val	Leu	Val	Leu	Ser	
		1075					1080					1085				
Asn	Trp	Ser	Ala	Gly	Val	Ser	Gln	Asn	Val	His	Leu	Gln	His	Asn	His	
	1090					1095						1100				
Gly	Tyr	Val	Leu	Arg	Val	Ile	Ala	Lys	Lys	Glu	Gly	Pro	Gly	Asn	Gly	
1105					1110					1115					1120	
Tyr	Val	Thr	Leu	Met	Asp	Cys	Glu	Glu	Asn	Gln	Glu	Lys	Leu	Thr	Phe	
				1125					1130					1135		
Thr	Ser	Cys	Glu	Gly	Tyr	Ile	Thr	Lys	Thr	Val	Asp	Val	Phe	Pro		
			1140				1145					1150				
Asp	Thr	Asp	Arg	Val	Arg	Ile	Glu	Ile	Gly	Glu	Thr	Glu	Gly	Ser	Phe	
		1155					1160					1165				
Tyr	Ile	Glu	Ser	Ile	Glu	Leu	Ile	Cys	Met	Asn	Glu					
	1170					1175					1180					

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 <212> PRT  
 <213> *Bacillus thuringiensis*

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 Asn Thr Asn Tyr Lys Asp Trp Leu Ala Met Cys Glu Asn Asn Gln Gln  
 20 25 30  
 Tyr Gly Val Asn Pro Ala Ala Ile Asn Ser Ser Ser Val Ser Thr Ala  
 35 40 45  
 Leu Lys Val Ala Gly Ala Ile Leu Lys Phe Val Asn Pro Pro Ala Gly  
 50 55 60  
 Thr Val Leu Thr Val Leu Ser Ala Val Leu Pro Ile Leu Trp Pro Thr  
 65 70 75 80  
 Asn Thr Pro Thr Pro Glu Arg Val Trp Asn Asp Phe Met Thr Asn Thr  
 85 90 95  
 Gly Asn Leu Ile Asp Gln Thr Val Thr Ala Tyr Val Arg Thr Asp Ala  
 100 105 110  
 Asn Ala Lys Met Thr Val Val Lys Asp Tyr Leu Asp Gln Tyr Thr Thr  
 115 120 125  
 Lys Phe Asn Thr Trp Lys Arg Glu Pro Asn Asn Gln Ser Tyr Arg Thr  
 130 135 140  
 Ala Val Ile Thr Gln Phe Asn Leu Thr Ser Ala Lys Leu Arg Glu Thr  
 145 150 155 160  
 Ala Val Tyr Phe Ser Asn Leu Val Gly Tyr Glu Leu Leu Leu Leu Pro  
 165 170 175  
 Ile Tyr Ala Gln Val Ala Asn Phe Asn Leu Leu Leu Ile Arg Asp Gly  
 180 185 190  
 Leu Ile Asn Ala Gln Glu Trp Ser Leu Ala Arg Ser Ala Gly Asp Gln  
 195 200 205  
 Leu Tyr Asn Thr Met Val Gln Tyr Thr Lys Glu Tyr Ile Ala His Ser  
 210 215 220  
 Ile Thr Trp Tyr Asn Lys Gly Leu Asp Val Leu Arg Asn Lys Ser Asn  
 225 230 235 240  
 Gly Gln Trp Ile Thr Phe Asn Asp Tyr Lys Arg Glu Met Thr Ile Gln  
 245 250 255  
 Val Leu Asp Ile Leu Ala Leu Phe Ala Ser Tyr Asp Pro Arg Arg Tyr  
 260 265 270  
 Pro Ala Asp Lys Ile Asp Asn Thr Lys Leu Ser Lys Thr Glu Phe Thr  
 275 280 285  
 Arg Glu Ile Tyr Thr Ala Leu Val Glu Ser Pro Ser Ser Lys Ser Ile  
 290 295 300  
 Ala Ala Leu Glu Ala Ala Leu Thr Arg Asp Val His Leu Phe Thr Trp  
 305 310 315 320  
 Leu Lys Arg Val Asp Phe Trp Thr Asn Thr Ile Tyr Gln Asp Leu Arg  
 325 330 335  
 Phe Leu Ser Ala Asn Lys Ile Gly Phe Ser Tyr Thr Asn Ser Ser Ala  
 340 345 350  
 Met Gln Glu Ser Gly Ile Tyr Gly Ser Ser Gly Phe Gly Ser Asn Leu  
 355 360 365  
 Thr His Gln Ile Gln Leu Asn Ser Asn Val Tyr Lys Thr Ser Ile Thr  
 370 375 380  
 Asp Thr Ser Ser Pro Ser Asn Arg Val Thr Lys Met Asp Phe Tyr Lys  
 385 390 395 400



Ile	Asp	Gly	Thr	Leu	Ala	Ser	Tyr	Asn	Ser	Asn	Ile	Thr	Pro	Thr	Pro		
				405					410					415			
Glu	Gly	Leu	Arg	Thr	Thr	Phe	Phe	Gly	Phe	Ser	Thr	Asn	Glu	Asn	Thr		
			420					425					430				
Pro	Asn	Gln	Pro	Thr	Val	Asn	Asp	Tyr	Thr	His	Ile	Leu	Ser	Tyr	Ile		
		435					440					445					
Lys	Thr	Asp	Val	Ile	Asp	Tyr	Asn	Ser	Asn	Arg	Val	Ser	Phe	Ala	Trp		
	450					455					460						
Thr	His	Lys	Ile	Val	Asp	Pro	Asn	Asn	Gln	Ile	Tyr	Thr	Asp	Ala	Ile		
465					470					475					480		
Thr	Gln	Val	Pro	Ala	Val	Lys	Ser	Asn	Phe	Leu	Asn	Ala	Thr	Ala	Lys		
				485					490						495		
Val	Ile	Lys	Gly	Pro	Gly	His	Thr	Gly	Gly	Asp	Leu	Val	Ala	Leu	Thr		
			500					505					510				
Ser	Asn	Gly	Thr	Leu	Ser	Gly	Arg	Met	Glu	Ile	Gln	Cys	Lys	Thr	Ser		
		515					520					525					
Ile	Phe	Asn	Asp	Pro	Thr	Arg	Ser	Tyr	Gly	Leu	Arg	Ile	Arg	Tyr	Ala		
	530					535						540					
Ala	Asn	Ser	Pro	Ile	Val	Leu	Asn	Val	Ser	Tyr	Val	Leu	Gln	Gly	Val		
545					550					555					560		
Ser	Arg	Gly	Thr	Thr	Ile	Ser	Thr	Glu	Ser	Thr	Phe	Ser	Arg	Pro	Asn		
				565				570						575			
Asn	Ile	Ile	Pro	Thr	Asp	Leu	Lys	Tyr	Glu	Glu	Phe	Arg	Tyr	Lys	Asp		
			580					585					590				
Pro	Phe	Asp	Ala	Ile	Val	Pro	Met	Arg	Leu	Ser	Ser	Asn	Gln	Leu	Ile		
		595					600					605					
Thr	Ile	Ala	Ile	Gln	Pro	Leu	Asn	Met	Thr	Ser	Asn	Asn	Gln	Val	Ile		
	610					615						620					
Ile	Asp	Arg	Ile	Glu	Ile	Ile	Pro	Ile	Thr	Gln	Ser	Val	Leu	Asp	Glu		
625					630					635					640		
Thr	Glu	Asn	Gln	Asn	Leu	Glu	Ser	Glu	Arg	Glu	Val	Val	Asn	Ala	Leu		
				645					650						655		
Phe	Thr	Asn	Asp	Ala	Lys	Asp	Ala	Leu	Asn	Ile	Gly	Thr	Thr	Asp	Tyr		
			660					665						670			
Asp	Ile	Asp	Gln	Ala	Ala	Asn	Leu	Val	Glu	Cys	Ile	Ser	Glu	Glu	Leu		
		675					680					685					
Tyr	Pro	Lys	Glu	Lys	Met	Leu	Leu	Leu	Asp	Glu	Val	Lys	Asn	Ala	Lys		
	690					695					700						
Gln	Leu	Ser	Gln	Ser	Arg	Asn	Val	Leu	Gln	Asn	Gly	Asp	Phe	Glu	Ser		
705					710					715					720		
Ala	Thr	Leu	Gly	Trp	Thr	Thr	Ser	Asp	Asn	Ile	Thr	Ile	Gln	Glu	Asp		
				725					730					735			
Asp	Pro	Ile	Phe	Lys	Gly	His	Tyr	Leu	His	Met	Ser	Gly	Ala	Arg	Asp		
			740					745					750				
Ile	Asp	Gly	Thr	Ile	Phe	Pro	Thr	Tyr	Ile	Phe	Gln	Lys	Ile	Asp	Glu		
		755					760					765					
Ser	Lys	Leu	Lys	Pro	Tyr	Thr	Arg	Tyr	Leu	Val	Arg	Gly	Phe	Val	Gly		
	770					775						780					
Ser	Ser	Lys	Asp	Val	Glu	Leu	Val	Val	Ser	Arg	Tyr	Gly	Glu	Glu	Ile		
785					790					795					800		
Asp	Ala	Ile	Met	Asn	Val	Pro	Ala	Asp	Leu	Asn	Tyr	Leu	Tyr	Pro	Ser		
				805					810					815			
Thr	Phe	Asp	Cys	Glu	Gly	Ser	Asn	Arg	Cys	Glu	Thr	Ser	Ala	Val	Pro		
			820					825					830				
Ala	Asn	Ile	Gly	Asn	Thr	Ser	Asp	Met	Leu	Tyr	Ser	Cys	Gln	Tyr	Asp		
		835					840					845					
Thr	Gly	Lys	Lys	His	Val	Val	Cys	Gln	Asp	Ser	His	Gln	Phe	Ser	Phe		

850		855		860	
Thr Ile Asp Thr Gly Ala Leu Asp Thr Asn Glu Asn Ile Gly Val Trp					
865		870		875	880
Val Met Phe Lys Ile Ser Ser Pro Asp Gly Tyr Ala Ser Leu Asp Asn					
	885		890		895
Leu Glu Val Ile Glu Glu Gly Pro Ile Asp Gly Glu Ala Leu Ser Arg					
	900		905		910
Val Lys His Met Glu Lys Lys Trp Asn Asp Gln Met Glu Ala Lys Arg					
	915		920		925
Ser Glu Thr Gln Gln Ala Tyr Asp Val Ala Lys Gln Ala Ile Asp Ala					
	930		935		940
Leu Phe Thr Asn Val Gln Asp Glu Ala Leu Gln Phe Asp Thr Thr Leu					
945		950		955	960
Ala Gln Ile Gln Tyr Ala Glu Tyr Leu Val Gln Ser Ile Pro Tyr Val					
	965		970		975
Tyr Asn Asp Trp Leu Ser Asp Val Pro Gly Met Asn Tyr Asp Ile Tyr					
	980		985		990
Val Glu Leu Asp Ala Arg Val Ala Gln Ala Arg Tyr Leu Tyr Asp Thr					
	995		1000		1005
Arg Asn Ile Ile Lys Asn Gly Asp Phe Thr Gln Gly Val Met Gly Trp					
	1010		1015		1020
His Val Thr Gly Asn Ala Asp Val Gln Gln Ile Asp Gly Val Ser Val					
1025		1030		1035	1040
Leu Val Leu Ser Asn Trp Ser Ala Gly Val Ser Gln Asn Val His Leu					
	1045		1050		1055
Gln His Asn His Gly Tyr Val Leu Arg Val Ile Ala Lys Lys Glu Gly					
	1060		1065		1070
Pro Gly Asn Gly Tyr Val Thr Leu Met Asp Cys Glu Glu Asn Gln Glu					
	1075		1080		1085
Lys Leu Thr Phe Thr Ser Cys Glu Glu Gly Tyr Ile Thr Lys Thr Val					
	1090		1095		1100
Asp Val Phe Pro Asp Thr Asp Arg Val Arg Ile Glu Ile Gly Glu Thr					
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Glu Gly Ser Phe Tyr Ile Glu Ser Ile Glu Leu Ile Cys Met Asn Glu					
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<211> 475

<212> PRT

<213> Bacillus thuringiensis

<400> 16

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Thr Ile Lys Leu Asn Ser Asn Lys Lys Tyr Gly Pro Gly Asp Met Thr					
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Asn Gly Asn Gln Phe Ile Ile Ser Lys Gln Glu Trp Ala Thr Ile Gly					
	35		40		45
Ala Tyr Ile Gln Thr Gly Leu Gly Leu Pro Val Asn Glu Gln Gln Leu					
	50		55		60
Arg Thr His Val Asn Leu Ser Gln Asp Ile Ser Ile Pro Ser Asp Phe					
65		70		75	80
Ser Gln Leu Tyr Asp Val Tyr Cys Ser Asp Lys Thr Ser Ala Glu Trp					
	85		90		95
Trp Asn Lys Asn Leu Tyr Pro Leu Ile Ile Lys Ser Ala Asn Asp Ile					
	100		105		110



			20					25					30				
Lys	Asn	Met	Asn	Tyr	Gln	Asp	Phe	Leu	Ser	Ile	Thr	Glu	Arg	Glu	Gln		
		35					40					45					
Pro	Glu	Ala	Leu	Ala	Ser	Gly	Asn	Thr	Ala	Ile	Asn	Thr	Val	Val	Ser		
		50				55						60					
Val	Thr	Gly	Ala	Thr	Leu	Ser	Ala	Leu	Gly	Val	Pro	Gly	Ala	Ser	Phe		
65					70					75					80		
Ile	Thr	Asn	Phe	Tyr	Leu	Lys	Ile	Ala	Gly	Leu	Leu	Trp	Pro	Glu	Asn		
			85						90					95			
Gly	Lys	Ile	Trp	Asp	Glu	Phe	Met	Thr	Glu	Val	Glu	Ala	Leu	Ile	Asp		
			100					105					110				
Gln	Lys	Ile	Glu	Glu	Tyr	Val	Arg	Asn	Lys	Ala	Ile	Ala	Glu	Leu	Asp		
		115					120					125					
Gly	Leu	Gly	Ser	Ala	Leu	Asp	Lys	Tyr	Gln	Lys	Ala	Leu	Ala	Asp	Trp		
		130				135					140						
Leu	Gly	Lys	Gln	Asp	Asp	Pro	Glu	Ala	Ile	Leu	Ser	Val	Ala	Thr	Glu		
145				150						155					160		
Phe	Arg	Ile	Ile	Asp	Ser	Leu	Phe	Glu	Phe	Ser	Met	Pro	Ser	Phe	Lys		
				165				170						175			
Val	Thr	Gly	Tyr	Glu	Ile	Pro	Leu	Leu	Thr	Val	Tyr	Ala	Gln	Ala	Ala		
			180				185						190				
Asn	Leu	His	Leu	Ala	Leu	Leu	Arg	Asp	Ser	Thr	Leu	Tyr	Gly	Asp	Lys		
		195					200						205				
Trp	Gly	Phe	Thr	Gln	Asn	Asn	Ile	Glu	Glu	Asn	Tyr	Asn	Arg	Gln	Lys		
		210				215						220					
Lys	Arg	Ile	Ser	Glu	Tyr	Ser	Asp	His	Cys	Thr	Lys	Trp	Tyr	Asn	Ser		
225					230					235					240		
Gly	Leu	Ser	Arg	Leu	Asn	Gly	Ser	Thr	Tyr	Glu	Gln	Trp	Ile	Asn	Tyr		
			245						250					255			
Asn	Arg	Phe	Arg	Arg	Glu	Met	Ile	Leu	Met	Ala	Leu	Asp	Leu	Val	Ala		
		260						265					270				
Val	Phe	Pro	Phe	His	Asp	Pro	Arg	Arg	Tyr	Ser	Met	Glu	Thr	Ser	Thr		
		275					280					285					
Gln	Leu	Thr	Arg	Glu	Val	Tyr	Thr	Asp	Pro	Val	Ser	Leu	Ser	Ile	Ser		
		290				295					300						
Asn	Pro	Asp	Ile	Gly	Pro	Ser	Phe	Ser	Gln	Met	Glu	Asn	Thr	Ala	Ile		
305					310				315						320		
Arg	Thr	Pro	His	Leu	Val	Asp	Tyr	Leu	Asp	Glu	Leu	Tyr	Ile	Tyr	Thr		
			325					330					335				
Ser	Lys	Tyr	Lys	Ala	Phe	Ser	His	Glu	Ile	Gln	Pro	Asp	Leu	Phe	Tyr		
			340					345					350				
Trp	Ser	Ala	His	Lys	Val	Ser	Phe	Lys	Lys	Ser	Glu	Gln	Ser	Asn	Leu		
		355					360					365					
Tyr	Thr	Thr	Gly	Ile	Tyr	Gly	Lys	Thr	Ser	Gly	Tyr	Ile	Ser	Ser	Gly		
		370				375					380						
Ala	Tyr	Ser	Phe	His	Gly	Asn	Asp	Ile	Tyr	Arg	Thr	Leu	Ala	Ala	Pro		
385					390					395					400		
Ser	Val	Val	Val	Tyr	Pro	Tyr	Thr	Gln	Asn	Tyr	Gly	Val	Glu	Gln	Val		
			405						410					415			
Glu	Phe	Tyr	Gly	Val	Lys	Gly	His	Val	His	Tyr	Arg	Gly	Asp	Asn	Lys		
			420				425					430					
Tyr	Asp	Leu	Thr	Tyr	Asp	Ser	Ile	Asp	Gln	Leu	Pro	Pro	Asp	Gly	Glu		
		435				440						445					
Pro	Ile	His	Glu	Lys	Tyr	Thr	His	Arg	Leu	Cys	His	Ala	Thr	Ala	Ile		
		450				455					460						
Phe	Lys	Ser	Thr	Pro	Asp	Tyr	Asp	Asn	Ala	Thr	Ile	Pro	Ile	Phe	Ser		
465					470					475					480		

Trp	Thr	His	Arg	Ser	Ala	Glu	Tyr	Tyr	Asn	Arg	Ile	Tyr	Pro	Asn	Lys			
				485					490					495				
Ile	Thr	Lys	Ile	Pro	Ala	Val	Lys	Met	Tyr	Lys	Leu	Asp	Asp	Pro	Ser			
			500					505					510					
Thr	Val	Val	Lys	Gly	Pro	Gly	Phe	Thr	Gly	Gly	Asp	Leu	Val	Lys	Arg			
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Gly	Ser	Thr	Gly	Tyr	Ile	Gly	Asp	Ile	Lys	Ala	Thr	Val	Asn	Ser	Pro			
	530					535					540							
Leu	Ser	Gln	Lys	Tyr	Arg	Val	Arg	Val	Arg	Tyr	Ala	Thr	Asn	Val	Ser			
545					550					555					560			
Gly	Gln	Phe	Asn	Val	Tyr	Ile	Asn	Asp	Lys	Ile	Thr	Leu	Gln	Thr	Lys			
			565					570						575				
Phe	Gln	Asn	Thr	Val	Glu	Thr	Ile	Gly	Glu	Gly	Lys	Asp	Leu	Thr	Tyr			
			580				585						590					
Gly	Ser	Phe	Gly	Tyr	Ile	Glu	Tyr	Ser	Thr	Thr	Ile	Gln	Phe	Pro	Asp			
		595					600					605						
Glu	His	Pro	Lys	Ile	Thr	Leu	His	Leu	Ser	Asp	Leu	Ser	Asn	Asn	Ser			
	610					615					620							
Ser	Phe	Tyr	Val	Asp	Ser	Ile	Glu	Phe	Ile	Pro	Val	Asp	Val	Asn	Tyr			
625					630					635					640			
Ala	Glu	Lys	Glu	Lys	Leu	Glu	Lys	Ala	Gln	Lys	Ala	Val	Asn	Thr	Leu			
				645					650					655				
Phe	Thr	Glu	Gly	Arg	Asn	Ala	Leu	Gln	Lys	Asp	Val	Thr	Asp	Tyr	Lys			
			660				665						670					
Val	Asp	Gln	Val	Ser	Ile	Leu	Val	Asp	Cys	Ile	Ser	Gly	Asp	Leu	Tyr			
		675				680						685						
Pro	Asn	Glu	Lys	Arg	Glu	Leu	Gln	Asn	Leu	Val	Lys	Tyr	Ala	Lys	Arg			
	690					695					700							
Leu	Ser	Tyr	Ser	Arg	Asn	Leu	Leu	Leu	Asp	Pro	Thr	Phe	Asp	Ser	Ile			
705					710					715					720			
Asn	Ser	Ser	Glu	Glu	Asn	Gly	Trp	Tyr	Gly	Ser	Asn	Gly	Ile	Val	Ile			
				725					730					735				
Gly	Asn	Gly	Asp	Phe	Val	Phe	Lys	Gly	Asn	Tyr	Leu	Ile	Phe	Ser	Gly			
			740					745					750					
Thr	Asn	Asp	Thr	Gln	Tyr	Pro	Thr	Tyr	Leu	Tyr	Gln	Lys	Ile	Asp	Glu			
		755					760					765						
Ser	Lys	Leu	Lys	Glu	Tyr	Thr	Arg	Tyr	Lys	Leu	Lys	Gly	Phe	Ile	Glu			
	770					775					780							
Ser	Ser	Gln	Asp	Leu	Glu	Ala	Tyr	Val	Ile	Arg	Tyr	Asp	Ala	Lys	His			
785					790					795					800			
Arg	Thr	Leu	Asp	Val	Ser	Asp	Asn	Leu	Leu	Pro	Asp	Ile	Leu	Pro	Glu			
				805				810					815					
Asn	Thr	Cys	Gly	Glu	Pro	Asn	Arg	Cys	Ala	Ala	Gln	Gln	Tyr	Leu	Asp			
			820					825					830					
Glu	Asn	Pro	Ser	Pro	Glu	Cys	Ser	Ser	Met	Gln	Asp	Gly	Ile	Leu	Ser			
		835					840					845						
Asp	Ser	His	Ser	Phe	Ser	Leu	Asn	Ile	Asp	Thr	Gly	Ser	Ile	Asn	His			
	850					855					860							
Asn	Glu	Asn	Leu	Gly	Ile	Trp	Val	Leu	Phe	Lys	Ile	Ser	Thr	Leu	Glu			
865					870					875					880			
Gly	Tyr	Ala	Lys	Phe	Gly	Asn	Leu	Glu	Val	Ile	Glu	Asp	Gly	Pro	Val			
				885				890						895				
Ile	Gly	Glu	Ala	Leu	Ala	Arg	Val	Lys	Arg	Gln	Glu	Thr	Lys	Trp	Arg			
			900					905					910					
Asn	Lys	Leu	Ala	Gln	Leu	Thr	Thr	Glu	Thr	Gln	Ala	Ile	Tyr	Thr	Arg			
		915					920					925						
Ala	Lys	Gln	Ala	Leu	Asp	Asn	Leu	Phe	Ala	Asn	Ala	Gln	Asp	Ser	His			

930	935	940
Leu Lys Arg Asp Val Thr Phe Ala Glu Ile Ala Ala Ala Arg Lys Ile		
945	950	955
Val Gln Ser Ile Arg Glu Ala Tyr Met Ser Trp Leu Ser Val Val Pro		960
	965	970
Gly Val Asn His Pro Ile Phe Thr Glu Leu Ser Gly Arg Val Gln Arg		975
	980	985
Ala Phe Gln Leu Tyr Asp Val Arg Asn Val Val Arg Asn Gly Arg Phe		990
	995	1000
Leu Asn Gly Leu Ser Asp Trp Ile Val Thr Ser Asp Val Lys Val Gln		1005
	1010	1015
Glu Glu Asn Gly Asn Asn Val Leu Val Leu Asn Asn Trp Asp Ala Gln		1020
1025	1030	1035
Val Leu Gln Asn Val Lys Leu Tyr Gln Asp Arg Gly Tyr Ile Leu His		1040
	1045	1050
Val Thr Ala Arg Lys Ile Gly Ile Gly Glu Gly Tyr Ile Thr Ile Thr		1055
	1060	1065
Asp Glu Glu Gly His Thr Asp Gln Leu Arg Phe Thr Ala Cys Glu Glu		1070
	1075	1080
Ile Asp Ala Ser Asn Ala Phe Ile Ser Gly Tyr Ile Thr Lys Glu Leu		1085
	1090	1095
Glu Phe Phe Pro Asp Thr Glu Lys Val His Ile Glu Ile Gly Glu Thr		1100
1105	1110	1115
Glu Gly Ile Phe Leu Val Glu Ser Ile Glu Leu Phe Leu Met Glu Glu		1120
	1125	1130
		1135
Leu Cys		

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 <213> Bacillus thuringiensis

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20 25 30
Pro Thr Asp Ala Leu Gln Asn Met Asn Tyr Lys Asp Tyr Leu Lys Met
35 40 45
Ser Gly Gly Glu Asn Pro Glu Leu Phe Gly Asn Pro Glu Thr Phe Ile
50 55 60
Ser Ser Ser Thr Ile Gln Thr Gly Ile Gly Ile Val Gly Arg Ile Leu
65 70 75 80
Gly Ala Leu Gly Val Pro Phe Ala Ser Gln Ile Ala Ser Phe Tyr Ser
85 90 95
Phe Ile Val Gly Gln Leu Trp Pro Ser Lys Ser Val Asp Ile Trp Gly
100 105 110
Glu Ile Met Glu Arg Val Glu Glu Val Asp Gln Lys Ile Glu Lys
115 120 125
Tyr Val Lys Asp Lys Ala Leu Ala Glu Leu Lys Gly Leu Gly Asn Ala
130 135 140
Leu Asp Val Tyr Gln Gln Ser Leu Glu Asp Trp Leu Glu Asn Arg Asn
145 150 155 160
Asp Ala Arg Thr Arg Ser Val Val Ser Asn Gln Phe Ile Ala Leu Asp
165 170 175



625					630					635				640
Ser	Met	Gly	Asp	Phe	Ser	Ser	Gly	Gln	Glu	Val	Tyr	Ile	Asp	Arg
				645					650				655	
Glu	Phe	Ile	Pro	Val	Asp	Glu	Thr	Tyr	Glu	Ala	Glu	Gln	Asp	Leu
			660					665					670	
Ala	Ala	Lys	Lys	Ala	Val	Asn	Ala	Leu	Phe	Thr	Asn	Thr	Lys	Asp
		675					680				685			Gly
Leu	Arg	Pro	Gly	Val	Thr	Asp	Tyr	Glu	Val	Asn	Gln	Ala	Ala	Asn
	690					695				700				Leu
Val	Glu	Cys	Leu	Ser	Asp	Asp	Leu	Tyr	Pro	Asn	Glu	Lys	Arg	Leu
705					710					715				Leu
Phe	Asp	Ala	Val	Arg	Glu	Ala	Lys	Arg	Leu	Ser	Gly	Ala	Arg	Asn
			725						730					Leu
Leu	Gln	Asp	Pro	Asp	Phe	Gln	Glu	Ile	Asn	Gly	Glu	Asn	Gly	Trp
		740					745					750		Ala
Ala	Ser	Thr	Gly	Ile	Glu	Ile	Val	Glu	Gly	Asp	Ala	Val	Phe	Lys
	755					760					765			Gly
Arg	Tyr	Leu	Arg	Leu	Pro	Gly	Ala	Arg	Glu	Ile	Asp	Thr	Glu	Thr
	770					775					780			Tyr
Pro	Thr	Tyr	Leu	Tyr	Gln	Lys	Val	Glu	Glu	Gly	Val	Leu	Lys	Pro
785					790					795				Tyr
Thr	Arg	Tyr	Arg	Leu	Arg	Gly	Phe	Val	Gly	Ser	Ser	Gln	Gly	Leu
			805						810					Glu
Ile	Tyr	Thr	Ile	Arg	His	Gln	Thr	Asn	Arg	Ile	Val	Lys	Asn	Val
		820						825					830	Pro
Asp	Asp	Leu	Leu	Pro	Asp	Val	Ser	Pro	Val	Asn	Ser	Asp	Gly	Ser
	835					840						845		Ile
Asn	Arg	Cys	Ser	Glu	Gln	Lys	Tyr	Val	Asn	Ser	Arg	Leu	Glu	Gly
	850					855					860			Glu
Asn	Arg	Ser	Gly	Asp	Ala	His	Glu	Phe	Ser	Leu	Pro	Ile	Asp	Ile
865					870					875				Gly
Glu	Leu	Asp	Tyr	Asn	Glu	Asn	Ala	Gly	Ile	Trp	Val	Gly	Phe	Lys
			885						890					Ile
Thr	Asp	Pro	Glu	Gly	Tyr	Ala	Thr	Leu	Gly	Asn	Leu	Glu	Leu	Val
		900						905				910		Glu
Glu	Gly	Pro	Leu	Ser	Gly	Asp	Ala	Leu	Glu	Arg	Leu	Gln	Arg	Glu
	915						920					925		Glu
Gln	Gln	Trp	Lys	Ile	Gln	Met	Thr	Arg	Arg	Arg	Glu	Glu	Thr	Asp
	930					935					940			Arg
Arg	Tyr	Met	Ala	Ser	Lys	Gln	Ala	Val	Asp	Arg	Leu	Tyr	Ala	Asp
945					950					955				Tyr
Gln	Asp	Gln	Gln	Leu	Asn	Pro	Asp	Val	Glu	Ile	Thr	Asp	Leu	Thr
			965						970				975	Ala
Ala	Gln	Asp	Leu	Ile	Gln	Ser	Ile	Pro	Tyr	Val	Tyr	Asn	Glu	Met
		980						985				990		Phe
Pro	Glu	Ile	Pro	Gly	Met	Asn	Tyr	Thr	Lys	Phe	Thr	Glu	Leu	Thr
	995						1000					1005		Asp
Arg	Leu	Gln	Gln	Ala	Trp	Asn	Leu	Tyr	Asp	Gln	Arg	Asn	Ala	Ile
	1010					1015					1020			Pro
Asn	Gly	Asp	Phe	Arg	Asn	Gly	Leu	Ser	Asn	Trp	Asn	Ala	Thr	Pro
1025					1030					1035				Gly
Val	Glu	Val	Gln	Gln	Ile	Asn	His	Thr	Ser	Val	Leu	Val	Ile	Pro
			1045						1050				1055	Asn
Trp	Asp	Glu	Gln	Val	Ser	Gln	Gln	Phe	Thr	Val	Gln	Pro	Asn	Gln
		1060						1065				1070		Arg
Tyr	Val	Leu	Arg	Val	Thr	Ala	Arg	Lys	Glu	Gly	Val	Gly	Asn	Gly
		1075					1080					1085		Tyr



Val	Ser	Ile	Arg	Asp	Gly	Gly	Asn	Gln	Ser	Glu	Thr	Leu	Thr	Phe	Ser
1090							1095					1100			
Ala	Ser	Asp	Tyr	Asp	Thr	Asn	Gly	Val	Tyr	Asn	Asp	Gln	Thr	Gly	Tyr
1105						1110				1115				1120	
Ile	Thr	Lys	Thr	Val	Thr	Phe	Ile	Pro	Tyr	Thr	Asp	Gln	Met	Trp	Ile
				1125					1130					1135	
Glu	Ile	Ser	Glu	Thr	Glu	Gly	Thr	Phe	Tyr	Ile	Glu	Ser	Val	Glu	Leu
			1140					1145					1150		
Ile	Val	Asp	Val	Glu											
		1155													

<210> 19

<211> 675

<212> PRT

<213> *Bacillus thuringiensis*

<400> 19

Met	Asn	Pro	Tyr	Gln	Asn	Lys	Asn	Glu	Tyr	Glu	Ile	Phe	Asn	Ala	Pro
1				5					10					15	
Ser	Asn	Gly	Phe	Ser	Lys	Ser	Asn	Asn	Tyr	Ser	Arg	Tyr	Pro	Leu	Ala
		20						25					30		
Asn	Lys	Pro	Asn	Gln	Pro	Leu	Lys	Asn	Thr	Asn	Tyr	Lys	Asp	Trp	Leu
		35					40					45			
Asn	Val	Cys	Gln	Asp	Asn	Gln	Gln	Tyr	Gly	Asn	Asn	Ala	Gly	Asn	Phe
	50					55					60				
Ala	Ser	Ser	Glu	Thr	Ile	Val	Gly	Val	Ser	Ala	Gly	Ile	Ile	Val	Val
65					70					75					80
Gly	Thr	Met	Leu	Gly	Ala	Phe	Ala	Ala	Pro	Val	Leu	Ala	Ala	Gly	Ile
			85						90					95	
Ile	Ser	Phe	Gly	Thr	Leu	Leu	Pro	Ile	Phe	Trp	Gln	Gly	Ser	Asp	Pro
			100					105						110	
Ala	Asn	Val	Trp	Gln	Asp	Leu	Leu	Asn	Ile	Gly	Gly	Arg	Pro	Ile	Gln
		115					120					125			
Glu	Ile	Asp	Lys	Asn	Ile	Ile	Asn	Val	Leu	Thr	Ser	Ile	Val	Thr	Pro
	130					135					140				
Ile	Lys	Asn	Gln	Leu	Asp	Lys	Tyr	Gln	Glu	Phe	Phe	Asp	Lys	Trp	Glu
145					150					155					160
Pro	Ala	Arg	Thr	His	Ala	Asn	Ala	Lys	Ala	Val	His	Asp	Leu	Phe	Thr
			165					170						175	
Thr	Leu	Glu	Pro	Ile	Ile	Asp	Lys	Asp	Leu	Asp	Met	Leu	Lys	Asn	Asn
			180					185					190		
Ala	Ser	Tyr	Arg	Ile	Pro	Thr	Leu	Pro	Ala	Tyr	Ala	Gln	Ile	Ala	Thr
		195					200					205			
Trp	His	Leu	Asn	Leu	Leu	Lys	His	Ala	Ala	Thr	Tyr	Tyr	Asn	Ile	Trp
	210					215						220			
Leu	Gln	Asn	Gln	Gly	Ile	Asn	Pro	Ser	Thr	Phe	Asn	Ser	Ser	Asn	Tyr
225					230					235					240
Tyr	Gln	Gly	Tyr	Leu	Lys	Arg	Lys	Ile	Gln	Glu	Tyr	Thr	Asp	Tyr	Cys
			245						250					255	
Ile	Gln	Thr	Tyr	Asn	Ala	Gly	Leu	Thr	Met	Ile	Arg	Thr	Asn	Thr	Asn
			260					265					270		
Ala	Thr	Trp	Asn	Met	Tyr	Asn	Thr	Tyr	Arg	Leu	Glu	Met	Thr	Leu	Thr
		275					280					285			
Val	Leu	Asp	Leu	Ile	Ala	Ile	Phe	Pro	Asn	Tyr	Asp	Pro	Glu	Lys	Tyr
	290					295					300				
Pro	Ile	Gly	Val	Lys	Ser	Glu	Leu	Ile	Arg	Glu	Val	Tyr	Thr	Asn	Val

305					310					315				320
Asn	Ser	Asp	Thr	Phe	Arg	Thr	Ile	Thr	Glu	Leu	Glu	Asn	Gly	Leu
				325					330					335
Arg	Asn	Pro	Thr	Leu	Phe	Thr	Trp	Ile	Asn	Gln	Gly	Arg	Phe	Tyr
			340					345					350	
Arg	Asn	Ser	Arg	Asp	Ile	Leu	Asp	Pro	Tyr	Asp	Ile	Phe	Ser	Phe
		355					360					365		
Gly	Asn	Gln	Met	Ala	Phe	Thr	His	Thr	Asn	Asp	Asp	Arg	Asn	Ile
	370					375				380				
Trp	Gly	Ala	Val	His	Gly	Asn	Ile	Ile	Ser	Gln	Asp	Thr	Ser	Lys
385					390					395				400
Phe	Pro	Phe	Tyr	Arg	Asn	Lys	Pro	Ile	Asp	Lys	Val	Glu	Ile	Val
				405					410					415
His	Arg	Glu	Tyr	Ser	Asp	Ile	Ile	Tyr	Glu	Met	Ile	Phe	Phe	Ser
		420						425					430	Asn
Ser	Ser	Glu	Val	Phe	Arg	Tyr	Ser	Ser	Asn	Ser	Thr	Ile	Glu	Asn
		435					440					445		Asn
Tyr	Lys	Arg	Thr	Asp	Ser	Tyr	Met	Ile	Pro	Lys	Gln	Thr	Trp	Lys
	450					455					460			Asn
Glu	Glu	Tyr	Gly	His	Thr	Leu	Ser	Tyr	Ile	Lys	Thr	Asp	Asn	Tyr
465					470					475				480
Phe	Ser	Val	Val	Arg	Glu	Arg	Arg	Arg	Val	Ala	Phe	Ser	Trp	Thr
				485					490					495
Thr	Ser	Val	Asp	Phe	Gln	Asn	Thr	Ile	Asp	Leu	Asp	Asn	Ile	Thr
		500						505					510	Gln
Ile	His	Ala	Leu	Lys	Ala	Leu	Lys	Val	Ser	Ser	Asp	Ser	Lys	Ile
	515						520					525		Val
Lys	Gly	Pro	Gly	His	Thr	Gly	Gly	Asp	Leu	Val	Ile	Leu	Lys	Asp
	530					535					540			Ser
Met	Asp	Phe	Arg	Val	Arg	Phe	Leu	Lys	Asn	Val	Ser	Arg	Gln	Tyr
545					550					555				Gln
Val	Arg	Ile	Arg	Tyr	Ala	Thr	Asn	Ala	Pro	Lys	Thr	Thr	Val	Phe
				565					570					575
Thr	Gly	Ile	Asp	Thr	Ile	Ser	Val	Glu	Leu	Pro	Ser	Thr	Thr	Ser
		580						585					590	Arg
Gln	Asn	Pro	Asn	Ala	Thr	Asp	Leu	Thr	Tyr	Ala	Asp	Phe	Gly	Tyr
	595						600					605		Val
Thr	Phe	Pro	Arg	Thr	Val	Pro	Asn	Lys	Thr	Phe	Glu	Gly	Glu	Asp
	610					615					620			Thr
Leu	Leu	Met	Thr	Leu	Tyr	Gly	Thr	Pro	Asn	His	Ser	Tyr	Asn	Ile
625					630					635				640
Ile	Asp	Lys	Ile	Glu	Phe	Ile	Pro	Ile	Thr	Gln	Ser	Val	Leu	Asp
				645					650					655
Thr	Glu	Lys	Gln	Asn	Ile	Glu	Lys	Thr	Gln	Lys	Ile	Val	Asn	Asp
			660					665					670	Leu
Phe	Val	Asn												
		675												

<210> 20  
 <211> 648  
 <212> PRT  
 <213> Bacillus thuringiensis

<400> 20  
 Met His Tyr Tyr Gly Asn Arg Asn Glu Tyr Asp Ile Leu Asn Ala Ser  
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Ser	Asn	Asp	Ser	Asn	Met	Ser	Asn	Thr	Tyr	Pro	Arg	Tyr	Pro	Leu	Ala
			20					25					30		
Asn	Pro	Gln	Gln	Asp	Leu	Met	Gln	Asn	Thr	Asn	Tyr	Lys	Asp	Trp	Leu
		35					40					45			
Asn	Val	Cys	Glu	Gly	Tyr	His	Ile	Glu	Asn	Pro	Arg	Glu	Ala	Ser	Val
	50					55					60				
Arg	Ala	Gly	Leu	Gly	Lys	Gly	Leu	Gly	Ile	Val	Ser	Thr	Ile	Val	Gly
65					70					75					80
Phe	Phe	Gly	Gly	Ser	Ile	Ile	Leu	Asp	Thr	Ile	Gly	Leu	Phe	Tyr	Gln
				85					90					95	
Ile	Ser	Glu	Leu	Leu	Trp	Pro	Glu	Asp	Thr	Gln	Gln	Tyr	Thr	Trp	
			100					105					110		
Gln	Asp	Ile	Met	Asn	His	Val	Glu	Asp	Leu	Ile	Asp	Lys	Arg	Ile	Thr
		115					120					125			
Glu	Val	Ile	Arg	Gly	Asn	Ala	Ile	Arg	Thr	Leu	Ala	Asp	Leu	Gln	Gly
	130					135						140			
Lys	Val	Asp	Asp	Tyr	Asn	Asn	Trp	Leu	Lys	Lys	Trp	Lys	Asp	Asp	Pro
145					150					155					160
Lys	Ser	Thr	Gly	Asn	Leu	Ser	Thr	Leu	Val	Thr	Lys	Phe	Thr	Ala	Leu
				165					170					175	
Asp	Ser	Asp	Phe	Asn	Gly	Ala	Ile	Arg	Thr	Val	Asn	Asn	Gln	Gly	Ser
			180					185					190		
Pro	Gly	Tyr	Glu	Leu	Leu	Leu	Leu	Pro	Val	Tyr	Ala	Gln	Ile	Ala	Asn
		195					200					205			
Leu	His	Leu	Leu	Leu	Leu	Arg	Asp	Ala	Gln	Ile	Tyr	Gly	Asp	Lys	Trp
	210					215						220			
Trp	Ser	Ala	Arg	Ala	Asn	Ala	Arg	Asp	Asn	Tyr	Tyr	Gln	Ile	Gln	Leu
225					230					235					240
Glu	Lys	Thr	Lys	Glu	Tyr	Thr	Glu	Tyr	Cys	Ile	Asn	Trp	Tyr	Asn	Lys
				245					250					255	
Gly	Leu	Asn	Asp	Phe	Arg	Thr	Ala	Gly	Gln	Trp	Val	Asn	Phe	Asn	Arg
			260					265					270		
Tyr	Arg	Arg	Glu	Met	Thr	Leu	Thr	Val	Leu	Asp	Ile	Ile	Ser	Met	Phe
		275					280					285			
Pro	Ile	Tyr	Asp	Ala	Arg	Leu	Tyr	Pro	Thr	Glu	Val	Lys	Thr	Glu	Leu
	290					295						300			
Thr	Arg	Glu	Ile	Tyr	Ser	Asp	Val	Ile	Asn	Gly	Glu	Ile	Tyr	Gly	Leu
305					310					315					320
Met	Thr	Pro	Tyr	Phe	Ser	Phe	Glu	Lys	Ala	Glu	Ser	Leu	Tyr	Thr	Arg
				325					330					335	
Ala	Pro	His	Leu	Phe	Thr	Trp	Leu	Lys	Gly	Phe	Arg	Phe	Val	Thr	Asn
			340					345					350		
Ser	Ile	Ser	Tyr	Trp	Thr	Phe	Leu	Ser	Gly	Gly	Gln	Asn	Lys	Tyr	Ser
	355						360					365			
Tyr	Thr	Asn	Asn	Ser	Ser	Ile	Asn	Glu	Gly	Ser	Phe	Arg	Gly	Gln	Asp
	370					375					380				
Thr	Asp	Tyr	Gly	Gly	Thr	Ser	Ser	Thr	Ile	Asn	Ile	Pro	Ser	Asn	Ser
385					390					395					400
Tyr	Val	Tyr	Asn	Leu	Trp	Thr	Glu	Asn	Tyr	Glu	Tyr	Ile	Tyr	Pro	Trp
			405						410					415	
Gly	Asp	Pro	Val	Asn	Ile	Thr	Lys	Met	Asn	Phe	Ser	Val	Thr	Asp	Asn
			420					425					430		
Asn	Ser	Ser	Lys	Glu	Leu	Ile	Tyr	Gly	Ala	His	Arg	Thr	Asn	Lys	Pro
	435						440					445			
Val	Val	Arg	Thr	Asp	Phe	Asp	Phe	Leu	Thr	Asn	Lys	Glu	Gly	Thr	Glu
	450					455					460				
Leu	Ala	Lys	Tyr	Asn	Asp	Tyr	Asn	His	Ile	Leu	Ser	Tyr	Met	Leu	Ile

465					470					475					480
Asn	Gly	Glu	Thr	Phe	Gly	Gln	Lys	Arg	His	Gly	Tyr	Ser	Phe	Ala	Phe
				485					490					495	
Thr	His	Ser	Ser	Val	Asp	Pro	Asn	Asn	Thr	Ile	Ala	Ala	Asn	Lys	Ile
			500					505					510		
Thr	Gln	Ile	Pro	Val	Val	Lys	Ala	Ser	Ser	Ile	Asn	Gly	Ser	Ile	Ser
		515					520					525			
Ile	Glu	Lys	Gly	Pro	Gly	Phe	Thr	Gly	Gly	Asp	Leu	Val	Lys	Met	Arg
	530					535					540				
Ala	Asp	Ser	Gly	Leu	Thr	Met	Arg	Phe	Lys	Ala	Glu	Leu	Leu	Asp	Lys
545					550					555					560
Lys	Tyr	Arg	Val	Arg	Ile	Arg	Tyr	Lys	Cys	Asn	Tyr	Ser	Ser	Lys	Leu
				565					570					575	
Ile	Leu	Arg	Lys	Trp	Lys	Gly	Glu	Gly	Tyr	Ile	Gln	Gln	Gln	Ile	His
			580					585					590		
Asn	Ile	Ser	Pro	Thr	Tyr	Gly	Ala	Phe	Ser	Tyr	Leu	Glu	Ser	Phe	Thr
		595					600					605			
Ile	Thr	Thr	Thr	Glu	Asn	Ile	Phe	Asp	Leu	Thr	Met	Glu	Val	Thr	Tyr
	610					615					620				
Pro	Tyr	Gly	Arg	Gln	Phe	Val	Glu	Asp	Ile	Pro	Ser	Leu	Ile	Leu	Asp
625					630					635					640
Lys	Ile	Glu	Phe	Leu	Pro	Thr	Asn								
				645											

<210> 21

<211> 682

<212> PRT

<213> Bacillus thuringiensis

<400> 21

Met	Asn	Ser	Tyr	Gln	Asn	Lys	Asn	Glu	Tyr	Glu	Ile	Leu	Asp	Ala	Lys
1				5					10					15	
Arg	Asn	Thr	Cys	His	Met	Ser	Asn	Cys	Tyr	Pro	Lys	Tyr	Pro	Leu	Ala
			20					25					30		
Asn	Asp	Pro	Gln	Met	Tyr	Leu	Arg	Asn	Thr	His	Tyr	Lys	Asp	Trp	Ile
		35					40					45			
Asn	Met	Cys	Glu	Glu	Ala	Ser	Tyr	Ala	Ser	Ser	Gly	Pro	Ser	Gln	Leu
	50					55					60				
Phe	Lys	Val	Gly	Gly	Ser	Ile	Val	Ala	Lys	Ile	Leu	Gly	Met	Ile	Pro
65					70					75					80
Glu	Val	Gly	Pro	Leu	Leu	Ser	Trp	Met	Val	Ser	Leu	Phe	Trp	Pro	Thr
				85					90					95	
Ile	Glu	Glu	Lys	Asn	Thr	Val	Trp	Glu	Asp	Met	Ile	Lys	Tyr	Val	Ala
			100					105					110		
Asn	Leu	Leu	Lys	Gln	Glu	Leu	Thr	Asn	Asp	Thr	Leu	Asn	Arg	Ala	Thr
		115					120					125			
Ser	Asn	Leu	Ser	Gly	Leu	Asn	Glu	Ser	Leu	Asn	Ile	Tyr	Asn	Arg	Ala
	130					135					140				
Leu	Ala	Ala	Trp	Lys	Gln	Asn	Lys	Asn	Asn	Phe	Ala	Ser	Gly	Glu	Leu
145					150					155					160
Ile	Arg	Ser	Tyr	Ile	Asn	Asp	Leu	His	Ile	Leu	Phe	Thr	Arg	Asp	Ile
				165					170					175	
Gln	Ser	Asp	Phe	Ser	Leu	Gly	Gly	Tyr	Glu	Thr	Val	Leu	Leu	Pro	Ser
			180					185					190		
Tyr	Ala	Ser	Ala	Ala	Asn	Leu	His	Leu	Leu	Leu	Leu	Arg	Asp	Val	Ala
		195					200						205		

Ile	Tyr	Gly	Lys	Glu	Leu	Gly	Tyr	Pro	Ser	Thr	Asp	Val	Glu	Phe	Tyr	210	215	220
Tyr	Asn	Glu	Gln	Lys	Tyr	Tyr	Thr	Glu	Lys	Tyr	Ser	Asn	Tyr	Cys	Val	225	230	235
Asn	Thr	Tyr	Lys	Ser	Gly	Leu	Glu	Ser	Lys	Lys	Gln	Ile	Gly	Trp	Ser	245	250	255
Asp	Phe	Asn	Arg	Tyr	Arg	Arg	Glu	Met	Thr	Leu	Ser	Val	Leu	Asp	Ile	260	265	270
Val	Ala	Leu	Phe	Pro	Leu	Tyr	Asp	Thr	Gly	Leu	Tyr	Pro	Ser	Lys	Asp	275	280	285
Gly	Lys	Ile	His	Val	Lys	Ala	Glu	Leu	Thr	Arg	Glu	Ile	Tyr	Ser	Asp	290	295	300
Val	Ile	Asn	Asp	His	Val	Tyr	Gly	Leu	Met	Val	Pro	Tyr	Ile	Ser	Phe	305	310	315
Glu	His	Ala	Glu	Ser	Leu	Tyr	Thr	Arg	Arg	Pro	His	Ala	Phe	Thr	Trp	325	330	335
Leu	Lys	Gly	Phe	Arg	Phe	Val	Thr	Asn	Ser	Ile	Asn	Ser	Trp	Thr	Phe	340	345	350
Leu	Ser	Gly	Gly	Glu	Asn	Arg	Tyr	Phe	Leu	Thr	His	Gly	Glu	Gly	Thr	355	360	365
Ile	Tyr	Asn	Gly	Pro	Phe	Leu	Gly	Gln	Asp	Thr	Glu	Tyr	Gly	Gly	Thr	370	375	380
Ser	Ser	Tyr	Ile	Asp	Ile	Ser	Asn	Asn	Ser	Ser	Ile	Tyr	Asn	Leu	Trp	385	390	395
Thr	Lys	Asn	Tyr	Glu	Trp	Ile	Tyr	Pro	Trp	Thr	Asp	Pro	Val	Asn	Ile	405	410	415
Thr	Lys	Ile	Asn	Phe	Ser	Ile	Thr	Asp	Asn	Ser	Asn	Ser	Ser	Glu	Ser	420	425	430
Ile	Tyr	Gly	Ala	Glu	Arg	Met	Asn	Lys	Pro	Thr	Val	Arg	Thr	Asp	Phe	435	440	445
Asn	Phe	Leu	Leu	Asn	Arg	Ala	Gly	Asn	Gly	Pro	Thr	Thr	Tyr	Asn	Asp	450	455	460
Tyr	Asn	His	Ile	Leu	Ser	Tyr	Met	Leu	Ile	Asn	Gly	Glu	Thr	Phe	Gly	465	470	475
Gln	Lys	Arg	His	Gly	Tyr	Ser	Phe	Ala	Phe	Thr	His	Ser	Ser	Val	Asp	485	490	495
Arg	Tyr	Asn	Thr	Ile	Val	Pro	Asp	Lys	Ile	Val	Gln	Ile	Pro	Ala	Val	500	505	510
Lys	Thr	Asn	Leu	Val	Gly	Ala	Asn	Ile	Ile	Lys	Gly	Pro	Gly	His	Thr	515	520	525
Gly	Gly	Asp	Leu	Leu	Lys	Leu	Glu	Tyr	Glu	Arg	Phe	Leu	Ser	Leu	Arg	530	535	540
Ile	Lys	Leu	Ile	Ala	Ser	Met	Thr	Phe	Arg	Ile	Arg	Ile	Arg	Tyr	Ala	545	550	555
Ser	Asn	Ile	Ser	Gly	Gln	Met	Met	Ile	Asn	Ile	Gly	Tyr	Gln	Asn	Pro	565	570	575
Thr	Tyr	Phe	Asn	Ile	Ile	Pro	Thr	Thr	Ser	Arg	Asp	Tyr	Thr	Glu	Leu	580	585	590
Lys	Phe	Glu	Asp	Phe	Gln	Leu	Val	Asp	Thr	Ser	Tyr	Ile	Tyr	Ser	Gly	595	600	605
Gly	Pro	Ser	Ile	Ser	Ser	Asn	Thr	Leu	Trp	Leu	Asp	Asn	Phe	Ser	Asn	610	615	620
Gly	Pro	Val	Ile	Ile	Asp	Lys	Ile	Glu	Phe	Ile	Pro	Leu	Gly	Ile	Thr	625	630	635
Leu	Asn	Gln	Ala	Gln	Gly	Tyr	Asp	Thr	Tyr	Asp	Gln	Asn	Ala	Asn	Gly	645	650	655
Met	Tyr	His	Gln	Asn	Tyr	Ser	Asn	Ser	Gly	Tyr	Asn	Tyr	Asn	Gln	Glu			

	660		665		670
Tyr	Asn	Thr	Tyr	Tyr	Gln
	675		680		

<210> 22  
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 <212> PRT  
 <213> *Bacillus thuringiensis*

<400> 22  
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 1 5 10 15  
 Gln Asn Asn Met Asn Met Pro Asn Arg Tyr Pro Phe Ala Asp Asp Pro  
 20 25 30  
 Asn Ala Val Met Lys Asn Gly Asn Tyr Lys Asp Trp Val Asn Glu Cys  
 35 40 45  
 Glu Gly Ser Asn Ile Ser Pro Ser Pro Ala Ala Ala Ile Thr Ser Lys  
 50 55 60  
 Ile Val Ser Ile Val Leu Lys Thr Leu Ala Lys Ala Val Ala Ser Ser  
 65 70 75 80  
 Leu Ala Asp Ser Ile Lys Ser Ser Leu Gly Ile Ser Lys Thr Ile Thr  
 85 90 95  
 Glu Asn Asn Val Ser Gln Val Ser Met Val Gln Val His Gln Ile Ile  
 100 105 110  
 Asn Arg Arg Ile Gln Glu Thr Ile Leu Asp Leu Gly Glu Ser Ser Leu  
 115 120 125  
 Asn Gly Leu Val Ala Ile Tyr Asn Arg Asp Tyr Leu Gly Ala Leu Glu  
 130 135 140  
 Ala Trp Asn Asn Asn Lys Ser Asn Ile Asn Tyr Gln Thr Asn Val Ala  
 145 150 155 160  
 Glu Ala Phe Lys Thr Val Glu Arg Glu Phe Phe Thr Lys Leu Lys Gly  
 165 170 175  
 Ile Tyr Arg Thr Ser Ser Ser Gln Ile Thr Leu Leu Pro Thr Phe Thr  
 180 185 190  
 Gln Ala Ala Asn Leu His Leu Ser Met Leu Arg Asp Ala Val Met Tyr  
 195 200 205  
 Gln Glu Gly Trp Asn Leu Gln Ser His Ile Asn Tyr Ser Lys Glu Leu  
 210 215 220  
 Asp Asp Ala Leu Glu Asp Tyr Thr Asn Tyr Cys Val Glu Val Tyr Thr  
 225 230 235 240  
 Lys Gly Leu Asn Ala Leu Arg Gly Ser Thr Ala Ile Asp Trp Leu Glu  
 245 250 255  
 Phe Asn Ser Phe Arg Arg Asp Met Thr Leu Met Val Leu Asp Leu Val  
 260 265 270  
 Ala Ile Phe Pro Asn Tyr Asn Pro Val Arg Tyr Pro Leu Ser Thr Lys  
 275 280 285  
 Ile Ser Leu Ser Arg Lys Ile Tyr Thr Asp Pro Val Gly Arg Thr Asp  
 290 295 300  
 Ser Pro Ser Phe Gly Asp Trp Thr Asn Thr Gly Arg Thr Leu Ala Asn  
 305 310 315 320  
 Phe Asn Asp Leu Glu Arg Glu Val Thr Asp Ser Pro Ser Leu Val Lys  
 325 330 335  
 Trp Leu Gly Asp Met Thr Ile Tyr Thr Gly Ala Ile Asp Ser Tyr Arg  
 340 345 350  
 Pro Thr Ser Pro Gly Asp Arg Ile Gly Val Trp Tyr Gly Asn Ile Asn  
 355 360 365

Ala Phe Tyr His Thr Gly Arg Thr Asp Val Val Met Phe Arg Gln Thr  
 370 375 380  
 Gly Asp Thr Ala Tyr Glu Asp Pro Ser Thr Phe Ile Ser Asn Ile Leu  
 385 390 395 400  
 Tyr Asp Asp Ile Tyr Lys Leu Asp Leu Arg Ala Ala Ala Val Ser Thr  
 405 410 415  
 Ile Gln Gly Ala Met Asp Thr Thr Phe Gly Val Ser Ser Ser Arg Phe  
 420 425 430  
 Phe Asp Ile Arg Gly Arg Asn Gln Leu Tyr Gln Ser Asn Lys Pro Tyr  
 435 440 445  
 Pro Ser Leu Pro Ile Thr Ile Thr Phe Pro Gly Glu Glu Ser Ser Glu  
 450 455 460  
 Gly Asn Ala Asn Asp Tyr Ser His Leu Leu Cys Asp Val Lys Ile Leu  
 465 470 475 480  
 Gln Glu Asp Ser Ser Asn Ile Cys Glu Gly Arg Ser Ser Leu Leu Ser  
 485 490 495  
 His Ala Trp Thr His Ala Ser Leu Asp Arg Asn Asn Thr Ile Leu Pro  
 500 505 510  
 Asp Glu Ile Thr Gln Ile Pro Ala Val Thr Ala Tyr Glu Leu Arg Gly  
 515 520 525  
 Asn Ser Ser Val Val Ala Gly Pro Gly Ser Thr Gly Gly Asp Leu Val  
 530 535 540  
 Lys Met Ser Tyr His Ser Val Trp Ser Phe Lys Val Tyr Cys Ser Glu  
 545 550 555 560  
 Leu Lys Asn Tyr Arg Val Arg Ile Arg Tyr Ala Ser His Gly Asn Cys  
 565 570 575  
 Gln Phe Leu Met Lys Arg Trp Pro Ser Thr Gly Val Ala Pro Arg Gln  
 580 585 590  
 Trp Ala Arg His Asn Val Gln Gly Thr Phe Ser Asn Ser Met Arg Tyr  
 595 600 605  
 Glu Ala Phe Lys Tyr Leu Asp Ile Phe Thr Ile Thr Pro Glu Glu Asn  
 610 615 620  
 Asn Phe Ala Phe Thr Ile Asp Leu Glu Ser Gly Gly Asp Leu Phe Ile  
 625 630 635 640  
 Asp Lys Ile Glu Phe Ile Pro Val Ser Gly Ser Ala Phe Glu Tyr Glu  
 645 650 655  
 Gly Lys Gln Asn Ile Glu Lys Thr Gln Lys Ala Val Asn Asp Leu Phe  
 660 665 670  
 Ile Asn

<210> 23  
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 <212> PRT  
 <213> *Bacillus thuringiensis*

<400> 23  
 Met Asn Pro Tyr Gln Asn Lys Ser Glu Cys Glu Ile Leu Asn Ala Pro  
 1 5 10 15  
 Leu Asn Asn Ile Asn Met Pro Asn Arg Tyr Pro Phe Ala Asn Asp Pro  
 20 25 30  
 Asn Ala Val Met Lys Asn Gly Asn Tyr Lys Asp Trp Leu Asn Glu Cys  
 35 40 45  
 Asp Gly Ile Thr Pro Ser Ile Phe Gly Thr Leu Gly Val Leu Ala Ser  
 50 55 60  
 Ile Val Ile Ser Thr Ile Asn Leu Ala Thr Ser Pro Ser Ile Gly Asp

65					70					75					80
Ala	Phe	Ala	Leu	Val	Ser	Ser	Ile	Gly	Glu	Tyr	Trp	Pro	Glu	Thr	Lys
				85					90					95	
Thr	Ser	Phe	Pro	Leu	Ser	Val	Ala	Asp	Val	Asn	Arg	Leu	Ile	Arg	Glu
			100					105					110		
Ala	Leu	Asp	Gln	Asn	Ala	Ile	Asn	Arg	Ala	Thr	Gly	Lys	Phe	Asn	Gly
		115					120					125			
Leu	Met	Asp	Thr	Tyr	Asn	Thr	Val	Tyr	Leu	Lys	Asn	Leu	Gln	Asp	Trp
	130					135					140				
Tyr	Asp	Thr	Arg	Ile	Pro	Ala	Asn	Pro	Gln	Gly	Asp	Ser	Gln	Leu	Arg
145					150					155					160
Glu	Ala	Ala	Arg	Arg	Ser	Leu	Glu	Glu	Ile	Glu	Arg	Asp	Phe	Arg	Lys
			165					170						175	
Ala	Leu	Ala	Gly	Glu	Phe	Ala	Glu	Ala	Gly	Ser	Gln	Ile	Val	Leu	Leu
		180					185					190			
Pro	Ile	Tyr	Ala	Gln	Ala	Ala	Asn	Ile	His	Leu	Leu	Ile	Leu	Lys	Asp
	195						200					205			
Ala	Met	Gln	Phe	Arg	Thr	Asp	Leu	Gly	Leu	Ile	Arg	Pro	Val	Gly	Val
	210					215					220				
Pro	Ile	Thr	Thr	Ser	Ala	Glu	Asp	Pro	Phe	Glu	Ser	Glu	Phe	Leu	Leu
225					230					235					240
Arg	Ile	Lys	Lys	Tyr	Thr	Asp	His	Cys	Ile	Ser	Tyr	Tyr	Asp	Asp	Gly
			245					250					255		
Leu	Ala	Lys	Ile	Arg	Ser	Arg	Gly	Ser	Asp	Gly	Glu	Thr	Trp	Trp	Glu
		260					265						270		
Phe	Asn	Lys	Phe	Arg	Arg	Glu	Met	Thr	Leu	Thr	Val	Leu	Asp	Leu	Val
	275						280					285			
Ala	Leu	Tyr	Pro	Thr	His	Asn	Ile	Lys	Leu	Tyr	Pro	Ile	Pro	Thr	Gln
	290					295					300				
Thr	Glu	Leu	Ser	Arg	Val	Val	Tyr	Thr	Asp	Pro	Val	Gly	Cys	Phe	Gly
305					310					315					320
Asn	Arg	Lys	Ser	Asp	Ile	Phe	Ser	Arg	Leu	Asn	Phe	Asp	Tyr	Leu	Glu
			325						330					335	
Asn	Arg	Leu	Thr	Arg	Pro	Arg	Glu	Pro	Phe	Asn	Tyr	Leu	Asn	Ser	Val
		340					345						350		
Gln	Leu	Phe	Ala	Ser	Thr	Val	Ser	Asn	Ser	Asn	Asn	Gly	Glu	Val	Leu
	355					360						365			
Arg	Gly	Asn	Leu	Asn	Lys	Ile	Met	Phe	Glu	Gly	Gly	Trp	Thr	Ala	Ser
	370					375					380				
Arg	Ser	Gly	Asp	Gly	Val	Thr	Thr	Gly	Thr	Pro	Phe	Ser	Thr	Met	Asp
385					390					395					400
Trp	Ser	Tyr	Gly	Trp	Gly	Tyr	Pro	Arg	Lys	His	Tyr	Ala	Glu	Ile	Thr
			405					410					415		
Ser	Arg	Ser	Gln	Ala	Leu	Pro	Gly	Leu	Asn	Asn	Ser	Ile	His	Val	Ile
		420					425						430		
Val	Gly	Ile	Asp	Ser	Phe	Arg	Ala	Ile	Gly	Pro	Gly	Gly	Gln	Gly	Asp
	435						440					445			
His	Thr	Phe	Ser	Leu	Pro	Gly	Gly	Asp	Met	Tyr	Asp	Cys	Gly	Lys	Val
	450					455					460				
Gln	Ile	Asn	Pro	Leu	Glu	Asp	Tyr	Arg	Asn	Ser	Asp	His	Trp	Ile	Ser
465					470					475					480
Asp	Met	Met	Thr	Ile	Asn	Gln	Ser	Val	Gln	Leu	Ala	Ser	Asn	Pro	Thr
			485					490						495	
Gln	Thr	Phe	Ala	Phe	Ser	Ala	Leu	Ser	Leu	Gly	Trp	His	His	Ser	Ser
		500					505					510			
Ala	Gly	Asn	Arg	Asn	Val	Tyr	Val	Tyr	Asp	Lys	Ile	Thr	Gln	Ile	Pro
	515						520					525			



Ala	Thr	Lys	Thr	Val	Arg	Glu	His	Pro	Met	Ile	Lys	Gly	Pro	Gly	Phe
530						535					540				
Thr	Gly	Gly	Asp	Leu	Ala	Asp	Leu	Ser	Ser	Asn	Ser	Asp	Ile	Leu	Gln
545					550					555					560
Tyr	Asp	Leu	Arg	Ser	Asp	Tyr	Asp	Asp	Arg	Leu	Thr	Glu	Asp	Val	Pro
				565					570					575	
Phe	Arg	Ile	Arg	Ile	Arg	Cys	Ala	Ser	Ile	Gly	Val	Ser	Thr	Ile	Ser
			580					585					590		
Val	Asp	Asn	Trp	Gly	Ser	Ser	Ser	Pro	Gln	Val	Thr	Val	Ala	Ser	Thr
	595						600					605			
Ala	Ala	Ser	Leu	Asp	Thr	Leu	Lys	Tyr	Glu	Ser	Phe	Gln	Tyr	Val	Ser
610						615					620				
Ile	Pro	Gly	Asn	Tyr	Tyr	Phe	Asp	Ser	Ala	Pro	Arg	Ile	Arg	Leu	Leu
625					630					635					640
Arg	Gln	Pro	Gly	Arg	Leu	Leu	Val	Asp	Arg	Ile	Glu	Ile	Ile	Pro	Val
				645					650					655	
Asn	Phe	Phe	Pro	Leu	Ser	Glu	Gln	Glu	Asn	Lys	Ser	Val	Asp	Ser	Leu
			660					665					670		
Phe	Ile	Asn													
		675													

<210> 24

<211> 659

<212> PRT

<213> *Bacillus thuringiensis*

<400> 24

Asn	Ser	Tyr	Glu	Asn	Lys	Asn	Glu	Tyr	Glu	Ile	Leu	Asn	Asp	Ser	Lys
1				5					10					15	
Lys	Ser	Asn	Met	Ser	Asn	Pro	Tyr	Leu	Arg	Tyr	Pro	Leu	Ala	Asn	Asp
			20					25				30			
Ser	Leu	Ala	Ser	Met	Gln	Asn	Thr	Asn	Tyr	Lys	Asp	Trp	Leu	Thr	Met
		35					40					45			
Cys	Asp	Arg	Thr	Asp	Thr	Asp	Val	Leu	Ser	Ser	Arg	Gly	Ala	Val	Ser
	50					55					60				
Thr	Gly	Val	Gly	Met	Leu	Ser	Thr	Ile	Leu	Ser	Leu	Phe	Gly	Ile	Pro
65					70				75						80
Leu	Ile	Gly	Glu	Gly	Ile	Asp	Leu	Leu	Leu	Gly	Ala	Ala	Asp	Phe	Leu
				85					90					95	
Trp	Pro	Glu	Ser	Asp	Gly	Gly	His	Gln	Tyr	Thr	Trp	Glu	Asp	Leu	Met
			100					105					110		
Asn	His	Ile	Glu	Glu	Leu	Met	Asp	Glu	Arg	Leu	Glu	Thr	Glu	Lys	Arg
		115					120					125			
Thr	Thr	Ala	Leu	Asp	Asp	Leu	Arg	Gly	Leu	Lys	Ala	Leu	Leu	Gly	Leu
	130					135					140				
Phe	Arg	Asp	Ala	Phe	Asp	Ser	Trp	Glu	Lys	Asn	Gln	Asn	Asp	Pro	Ile
145					150					155					160
Ala	Lys	Asn	Arg	Val	Gly	Gly	Tyr	Phe	Glu	Asp	Val	His	Thr	His	Phe
				165					170					175	
Val	Lys	Asp	Met	Ala	Ser	Ile	Phe	Ser	Ala	Thr	Asn	Tyr	Glu	Val	Leu
			180					185					190		
Leu	Leu	Pro	Val	Tyr	Ala	Gln	Ala	Ala	Asn	Leu	His	Leu	Leu	Leu	Leu
		195					200					205			
Arg	Glu	Gly	Val	Ile	Tyr	Gly	Ser	Arg	Trp	Gly	Ile	Ala	Pro	Ala	Ala
	210					215					220				
Asp	Phe	Tyr	His	Asp	Gln	Leu	Leu	Lys	Tyr	Thr	Ala	Ile	Tyr	Ala	Asn

225					230					235				240
His	Cys	Val	Thr	Trp	Tyr	Asn	Asn	Gly	Leu	Ala	Gln	Gln	Lys	Glu
				245					250					255
Phe	Ala	Lys	Ser	Pro	Asn	Trp	Asn	Arg	Phe	Asn	Ala	Tyr	Arg	Arg
			260					265					270	
Met	Thr	Ile	Thr	Val	Leu	Asp	Ile	Ile	Ala	Leu	Phe	Pro	Thr	Tyr
		275					280					285		
Ala	Arg	Leu	Tyr	Thr	Lys	Pro	Ile	Lys	Thr	Glu	Leu	Thr	Arg	Glu
	290					295				300				
Tyr	Ser	Asp	Val	Leu	Asn	Leu	Asp	Val	Tyr	Gly	Val	Gln	Gln	Thr
305					310					315				320
Leu	Asn	Lys	Asn	Glu	Ala	Ala	Phe	Thr	Arg	Ser	Pro	His	Leu	Val
			325					330					335	
Arg	Leu	Arg	Gly	Phe	Asp	Phe	Tyr	Thr	Arg	Thr	Lys	Tyr	Ala	Tyr
			340					345					350	
Arg	Tyr	Leu	Ala	Gly	His	Thr	Asn	Tyr	Phe	Ser	Phe	Thr	Gly	Asn
		355					360					365		
Thr	Ile	Tyr	Ser	Ser	Ser	Phe	Asn	Asn	Trp	Tyr	Asp	Thr	Asp	Met
	370					375					380			
Lys	Ser	Thr	Ile	Asn	Ile	Pro	Asp	Tyr	Ala	Asn	Ile	Tyr	Lys	Leu
385				390					395					400
Thr	Lys	Ser	Tyr	Thr	Asn	Ile	Ser	Pro	Tyr	Thr	Asp	Pro	Val	Gly
				405				410					415	
Ser	Gln	Met	Gln	Phe	Ser	Leu	Thr	Asn	Asn	Gln	Gln	Leu	Thr	Tyr
		420					425					430		
Gly	Thr	Ser	Ala	Pro	Lys	Tyr	Pro	Val	Arg	Glu	Thr	Phe	Phe	Glu
	435					440					445			
Pro	Pro	Thr	Asp	Glu	Lys	Pro	Leu	Thr	Tyr	Glu	Asn	Tyr	Ser	His
	450				455					460				
Leu	Ser	Tyr	Met	Thr	Ser	Ala	Gln	His	Phe	Gly	Asp	Lys	Lys	Ile
465				470					475					480
Tyr	Thr	Phe	Ala	Trp	Met	His	Glu	Ser	Val	Asp	Phe	Asp	Asn	Arg
			485				490						495	
Asp	Pro	Asp	Lys	Ile	Thr	Gln	Ile	Pro	Ala	Val	Lys	Gly	Asp	Tyr
		500					505					510		
Gln	Tyr	Gly	Tyr	Val	Lys	Gln	Gly	Pro	Gly	His	Thr	Gly	Gly	Asp
	515					520					525			
Val	Ser	Met	Ile	Arg	Thr	Asp	Arg	Leu	Gly	Ile	Asn	Val	Tyr	Phe
	530				535				540					
Gln	Pro	Leu	Asp	Tyr	Arg	Ile	Arg	Ile	Arg	Tyr	Ser	Thr	Ser	Ser
545				550					555					560
Gly	Tyr	Leu	Tyr	Ile	Tyr	Ser	Pro	Asn	Thr	Lys	Ile	Val	Tyr	Leu
			565				570						575	
Pro	Thr	Thr	Leu	Val	Asp	Gly	Gln	Pro	Thr	Phe	Asp	Pro	Met	Asp
		580				585						590		
Ser	Ala	Phe	Arg	Val	Val	Glu	Val	Pro	Ala	Ser	Phe	Arg	Ala	Ser
	595					600					605			
Ala	Gly	Tyr	Thr	Asn	Phe	Thr	Ile	Glu	Ala	Gly	Phe	Gly	Pro	Val
	610				615				620					
Ile	Asp	Lys	Ile	Glu	Phe	Ile	Pro	Asp	Asn	Thr	Thr	Thr	Leu	Glu
625				630					635					640
Glu	Gly	Gly	Arg	Asp	Leu	Glu	Lys	Thr	Lys	Asn	Ala	Val	Asn	Asp
			645				650						655	
Phe	Thr	Asn												

<210> 25  
 <211> 666  
 <212> PRT  
 <213> *Bacillus thuringiensis*

<400> 25

Asn	Ser	Tyr	Glu	Asn	Lys	Asn	Glu	Tyr	Glu	Ile	Leu	Glu	Ser	Ser	Ser
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Asn	Asn	Thr	Asn	Met	Pro	Asn	Arg	Tyr	Pro	Phe	Ala	Asn	Asp	Arg	Asp
			20					25					30		
Met	Ser	Thr	Met	Ser	Phe	Asn	Asp	Cys	Gln	Gly	Ile	Ser	Trp	Asp	Glu
		35					40						45		
Ile	Trp	Glu	Ser	Ala	Glu	Thr	Ile	Thr	Ser	Ile	Gly	Ile	Asp	Leu	Ile
	50					55					60				
Glu	Phe	Leu	Met	Glu	Pro	Ser	Leu	Gly	Gly	Ile	Asn	Thr	Leu	Phe	Ser
65					70					75					80
Ile	Ile	Gly	Lys	Leu	Ile	Pro	Thr	Asn	His	Gln	Ser	Val	Ser	Ala	Leu
				85					90					95	
Ser	Ile	Cys	Asp	Leu	Leu	Ser	Ile	Ile	Arg	Lys	Glu	Val	Ala	Asp	Ser
			100					105					110		
Val	Leu	Ser	Asp	Ala	Ile	Cys	Arg	Phe	Leu	Asp	Gly	Lys	Leu	Lys	Asn
		115					120				125				
Tyr	Arg	Glu	Tyr	Tyr	Leu	Pro	Tyr	Leu	Glu	Ala	Trp	Leu	Lys	Asp	Gly
	130					135					140				
Lys	Pro	Leu	Gln	Lys	Thr	Asn	Asn	Ser	Asp	Ile	Gly	Gln	Leu	Val	Lys
145					150					155					160
Tyr	Phe	Glu	Leu	Ser	Glu	Arg	Asp	Phe	Asn	Glu	Ile	Leu	Gly	Gly	Ser
				165				170						175	
Leu	Ala	Arg	Asn	Asn	Ala	Gln	Ile	Leu	Leu	Leu	Pro	Tyr	Phe	Cys	Ala
			180					185					190		
Ser	Cys	Lys	Cys	Gln	Leu	Leu	Leu	Arg	Asp	Ala	Val	Gln	Tyr	Glu	
		195					200				205				
Glu	Gln	Trp	Phe	Pro	Phe	Leu	Ser	Ala	Glu	Asn	Val	Arg	Ser	Glu	Leu
		210				215					220				
Ile	Ser	Pro	Asn	Ser	Gly	Cys	Asp	Phe	Thr	Gly	Asp	Tyr	Tyr	Glu	Arg
225					230					235					240
Leu	Lys	Cys	Lys	Ile	Ala	Glu	Tyr	Thr	Asp	Tyr	Cys	Glu	Tyr	Trp	Tyr
				245					250					255	
Gln	Ala	Gly	Leu	Asn	Gln	Ile	Lys	Gln	Ala	Gly	Thr	Gly	Ala	Asp	Thr
			260					265					270		
Trp	Ala	Lys	Phe	Asn	Lys	Phe	Arg	Arg	Glu	Met	Thr	Leu	Thr	Val	Leu
		275					280					285			
Asp	Ile	Ile	Ala	Ile	Phe	Gln	Thr	Tyr	Asp	Phe	Lys	Lys	Tyr	Pro	Leu
	290					295					300				
Pro	Thr	His	Val	Glu	Leu	Thr	Arg	Glu	Ile	Tyr	Thr	Asp	Pro	Val	Gly
305					310					315					320
Tyr	Ser	Ser	Gly	Thr	Tyr	Ser	Trp	Leu	Lys	Tyr	Trp	Thr	Gly	Ala	Phe
			325						330					335	
Asn	Thr	Leu	Glu	Ala	Asn	Gly	Thr	Arg	Gly	Pro	Gly	Leu	Val	Thr	Trp
			340					345					350		
Leu	Arg	Ser	Ile	Gly	Ile	Tyr	Asn	Glu	Tyr	Val	Ser	Arg	Tyr	Phe	Ser
		355					360					365			
Gly	Trp	Val	Gly	Thr	Arg	His	Tyr	Glu	Asp	Tyr	Thr	Thr	Gly	Asn	Gly
	370					375					380				
Asn	Phe	Gln	Arg	Met	Ser	Gly	Thr	Thr	Ser	Asn	Asp	Leu	Arg	Asp	Ile
385					390					395					400
Ser	Phe	Pro	Asn	Ser	Asp	Ile	Phe	Lys	Ile	Glu	Ser	Lys	Ala	Ile	Met

Asn	Leu	Val	Gly	405	Glu	Ile	Asn	Ala	Arg	410	Pro	Glu	Tyr	Arg	415	Val	Ser	Arg
			420						425						430			
Ala	Glu	Phe	Ser	Glu	Ser	Thr	Ala	Phe	Ile	Tyr	Leu	Tyr	Asp	Ala	Gly			
		435					440						445					
Asn	Ser	Gly	Leu	Ser	Ser	Met	Thr	Ile	Thr	Ser	Lys	Leu	Pro	Gly	Ile			
	450					455					460							
Lys	Asn	Pro	Glu	Pro	Ser	Tyr	Arg	Asp	Tyr	Ser	His	Arg	Leu	Ser	Asn			
465					470					475					480			
Ala	Ala	Cys	Val	Gly	Ala	Gly	Asn	Ser	Arg	Ile	Asn	Val	Tyr	Gly	Trp			
			485						490					495				
Thr	His	Thr	Ser	Met	Ser	Lys	Tyr	Asn	Leu	Ile	Tyr	Pro	Asp	Lys	Ile			
			500					505					510					
Thr	Gln	Ile	Pro	Ala	Val	Lys	Ala	Phe	Asp	Ile	Ser	Asp	Thr	Gly	Pro			
	515						520					525						
Gly	Gln	Val	Ile	Ala	Gly	Pro	Gly	His	Thr	Gly	Gly	Asn	Val	Val	Ser			
	530					535					540							
Leu	Pro	Tyr	Tyr	Ser	Arg	Leu	Lys	Ile	Arg	Leu	Ile	Pro	Ala	Ser	Thr			
545					550					555					560			
Asn	Lys	Asn	Tyr	Leu	Val	Arg	Val	Arg	Tyr	Thr	Ser	Thr	Ser	Asn	Gly			
			565					570						575				
Arg	Leu	Leu	Val	Glu	Arg	Trp	Ser	Pro	Ser	Ser	Ile	Ile	Asn	Ser	Tyr			
			580					585					590					
Phe	Phe	Leu	Pro	Ser	Thr	Gly	Pro	Gly	Asp	Ser	Phe	Gly	Tyr	Val	Asp			
	595					600					605							
Thr	Leu	Val	Thr	Thr	Phe	Asn	Gln	Pro	Gly	Val	Glu	Ile	Ile	Ile	Gln			
	610					615					620							
Asn	Leu	Asp	Thr	Pro	Ile	Asn	Val	Asp	Lys	Val	Glu	Phe	Ile	Pro	Val			
625					630					635					640			
Asn	Ser	Thr	Ala	Leu	Glu	Tyr	Glu	Gly	Lys	Gln	Ser	Leu	Glu	Lys	Ala			
			645					650						655				
Gln	Asp	Val	Val	Asn	Asp	Leu	Phe	Val	Lys									
		660						665										

<210> 26  
 <211> 529  
 <212> PRT  
 <213> Bacillus thuringiensis

<400> 26  
 Val Asn Phe Met Leu Thr Ser Gly Ala Lys Asn Met Leu Lys Leu Glu  
 1 5 10 15  
 Thr Thr Asp Tyr Glu Ile Asp Gln Met Ala Asn Ala Ile Glu Asn Met  
 20 25 30  
 Ser Gly Glu Gln Tyr Ser Gln Glu Lys Met Met Gln Trp His Asp Ile  
 35 40 45  
 Lys Tyr Ala Lys Gln Leu Ser Gln Ala Arg Asn Leu Leu Gln Asn Gly  
 50 55 60  
 Asp Phe Glu Asp Leu Phe Ser Gly Trp Thr Thr Ser Asn Gln Met Ser  
 65 70 75 80  
 Ile Gln Ala Asp Asn Ala Thr Phe Lys Gly Asn Tyr Leu His Met Ser  
 85 90 95  
 Gly Ala Arg Asp Ile Tyr Gly Thr Ile Phe Pro Thr Tyr Ile Tyr Gln  
 100 105 110  
 Lys Ile Asp Glu Ser Lys Leu Lys Pro Tyr Thr Arg Tyr Leu Val Arg  
 115 120 125



<400> 27

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Gly	Asn	Arg	Glu	Thr	Leu	Lys	Phe	Thr	Ser	Cys	Glu	Glu	Gly	Tyr	Met
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Thr	Lys	Thr	Val	Glu	Val	Phe	Pro	Glu	Ser	Asp	Arg	Val	Arg	Ile	Glu
	450					455					460				
Ile	Gly	Glu	Thr	Glu	Gly	Thr	Phe	Tyr	Val	Asp	Ser	Ile	Glu	Leu	Leu
465					470					475					480
Cys	Met	Gln	Gly	Tyr	Ala	Ser	Asn	Asn	Asn	Pro	His	Thr	Gly	Asn	Met
				485					490					495	
Tyr	Gly	Gln	Ser	Tyr	Asn	Gly	Asn	Tyr	Asn	Gln	Asn	Thr	Ser	Asp	Val
			500					505					510		
Tyr	His	Gln	Gly	Tyr	Thr	Asn	Asn	Tyr	Asn	Gln	Asn	Ser	Ser	Asn	Met
		515					520					525			
Tyr	Asn	Gln	Asn	Tyr	Thr	His	Asn	Asp	Asp	Leu	His	Ser	Gly	Cys	Thr
		530				535					540				
Cys	Asn	Gln	Gly	His	Asn	Ser	Gly	Cys	Thr	Cys	Ser	Gln	Gly		
545					550					555					

<210> 28

<211> 558

<212> PRT

<213> Bacillus thuringiensis

<400> 28

Met	Phe	Thr	Asn	Gly	Thr	Lys	Asn	Thr	Leu	Lys	Ile	Glu	Thr	Thr	Asp
1				5					10					15	
Tyr	Glu	Ile	Asp	Gln	Ala	Ala	Ile	Ser	Ile	Glu	Cys	Met	Ser	Asp	Glu
			20					25					30		
His	Ser	Pro	Lys	Glu	Lys	Met	Met	Leu	Trp	Asp	Glu	Val	Lys	Arg	Ala
		35				40						45			
Lys	Leu	Leu	Ser	Gln	Ser	Arg	Asn	Leu	Leu	Gln	Asn	Gly	Asp	Phe	Gly
	50					55				60					
Asp	Phe	Tyr	Gly	Asn	Asp	Trp	Lys	Phe	Gly	Asn	Asn	Ile	Ile	Ile	Gly
65				70					75					80	
Ser	Asn	Asn	Ser	Ile	Phe	Lys	Gly	Asn	Phe	Leu	Gln	Met	Ser	Gly	Ala
			85					90						95	
Arg	Asp	Ile	Tyr	Gly	Thr	Ile	Phe	Pro	Thr	Tyr	Ile	Tyr	Gln	Lys	Ile
		100						105					110		
Asp	Glu	Ser	Lys	Leu	Lys	Pro	Tyr	Thr	Arg	Tyr	Arg	Val	Arg	Gly	Phe
		115					120					125			
Val	Gly	Ser	Ser	Lys	Asp	Leu	Arg	Leu	Met	Val	Thr	Arg	Tyr	Gly	Lys
	130					135				140					
Glu	Ile	Asp	Ala	Met	Met	Asn	Val	Pro	Asn	Asp	Leu	Ala	Tyr	Met	Gln
145				150					155					160	
Pro	Asn	Pro	Ser	Cys	Gly	Asp	Ser	Arg	Cys	Glu	Ser	Ser	Ser	Gln	Tyr
			165						170					175	
Val	Ser	Gln	Gly	Tyr	Pro	Thr	Pro	Thr	Asp	Gly	Tyr	Ala	Pro	Asp	Arg
		180						185					190		
Tyr	Ala	Cys	Pro	Ser	Ser	Ser	Asp	Lys	Lys	His	Val	Met	Cys	His	Asp
		195					200					205			
Arg	His	Pro	Phe	Asp	Phe	His	Ile	Asp	Thr	Gly	Glu	Leu	Asp	Thr	Asn
	210					215					220				
Thr	Asn	Val	Gly	Ile	Asp	Val	Leu	Phe	Lys	Ile	Ser	Asn	Pro	Asp	Gly
225				230						235				240	
Tyr	Ala	Thr	Leu	Gly	Asn	Leu	Glu	Val	Ile	Glu	Glu	Gly	Pro	Leu	Thr
			245					250					255		
Gly	Glu	Ala	Leu	Thr	His	Val	Lys	Gln	Lys	Glu	Lys	Lys	Trp	Lys	Gln

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